




ANNUAL REPORT
OF THE
Fruit Growers' Association
OF
ONTARIO
1914



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FORTY-SIXTH ANNUAL REPORT
OF THE
Fruit Growers' Association
OF
Ontario
1914

(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE, TORONTO.)

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO



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1915

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TORONTO

To His Honour JOHN STRATHEARN HENDRIE, C.V.O., a Lieutenant-Colonel in the
Militia of Canada, etc., etc., etc.,

Lieutenant-Governor of the Province of Ontario.

MAY IT PLEASE YOUR HONOUR:

I have the honour to present the Forty-sixth Annual Report of the Fruit
Growers' Association of Ontario.

Respectfully submitted,

JAMES S. DUFF,

Minister of Agriculture.

DEPARTMENT OF AGRICULTURE,

TORONTO, 1915.

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Fruit Growers' Association of Ontario

OFFICERS FOR 1915

President ELMER LICK, Oshawa.
Vice-President DR. A. J. GRANT, Thedford.
Secretary-Treasurer P. W. HODGETTS, Parliament Buildings, Toronto.
Executive Officers, and C. W. GURNEY, ROBT. THOMPSON.

DIRECTORS.

Div. 1. J. P. SMITH, Mountain.	Div. 8. R. THOMPSON, St. Catharines.
2. C. W. BEAVEN, Prescott.	9. GEO. SCHUYLER, Simcoe.
3. F. S. WALLBRIDGE, Belleville.	10. DR. A. J. GRANT, Thedford.
4. ELMER LICK, Oshawa.	11. KENNETH CAMERON, Lucknow.
5. W. J. BRAGG, Bowmanville.	12. C. W. GURNEY, Paris.
6. H. T. FOSTER, Burlington.	13. W. J. SAUNDERS, East Linton.
7. R. H. DEWAR, Fruitland.	

Ontario Agricultural College: PROF. J. W. CROW.

Vineland Experiment Station: F. M. CLEMENT.

REPRESENTATIVES TO FAIR BOARDS AND CONVENTIONS.

Canadian National: H. T. FOSTER, Burlington.

London: DR. A. J. GRANT, Thedford; C. W. GURNEY, Paris.

Ottawa: W. T. MACOUN, Ottawa; D. JOHNSON, Ottawa.

Ontario Horticultural Exhibition: ROBT. THOMPSON, St. Catharines; ELMER LICK, Oshawa; H. T. FOSTER, Burlington; P. W. HODGETTS, Toronto.

COMMITTEES:

Transportation: A. ONSLOW, Niagara; GEO. FRENCH, Sarnia; W. J. BRAGG, Bowmanville.

Co-operation: ROBT. THOMPSON, St. Catharines; C. W. GURNEY, Paris; PROF. J. W. CROW, Guelph; DR. A. J. GRANT, Thedford.

New Fruits: W. T. MACOUN, Ottawa; PROF. J. W. CROW, Guelph; F. M. CLEMENT, Vineland Station.

Historical: A. W. PEART, Burlington; W. T. MACOUN, Ottawa.

TREASURER'S REPORT, 1914

RECEIPTS.

Balance on hand, 1913	\$8 21
Members' fees	384 15
Show, fruit sold	518 52
Grant	2,200 00
Interest	13 56
Co-operative Association	30 00

\$3,154 44

EXPENDITURES.

Annual meeting	\$192 50
Committees	75 70
Printing	15 25
Show	248 45
Periodicals	732 20
Transportation	1,164 39
Miscellaneous	17 70
Balance on hand	708 25

\$3,154 44

DETAILS OF EXPENDITURE.

ANNUAL MEETING.

Directors' expenses:	
J. J. Gilbertson.....	\$7 15
F. M. Lewis	2 40
W. J. Saunders	10 25
Delegates' expenses, St. Catharines:	
Cold Storage Co.	20 90
Wm. C. DeLatre	3 40
R. R. Davis	3 40
J. E. Palmer	3 40
Roy Scratch	6 25
F. S. Wallbridge	10 40
Reporting, Angus & Stonehouse	100 00
Advertising, <i>Farmers' Advocate</i>	14 00
Expenses Convention, 1913,	
P. W. Hodgetts	5 60
Expenses Convention, 1914...	5 35
Total	\$192 50

SHOW.

1913—	
Canadian Express	\$4 01
Bell Telephone	0 30
1914—	
Manning Cold Storage	22 67
St. Catharines Cold Storage	6 40
Judges—	
L. Parsons	13 85
M. L. Watts	10 60
Tickets, National Live Stock	
Show	38 50
Canadian Express	2 12
Services, E. T. Reed.....	150 00
	\$248 45

PERIODICALS.

<i>Canadian Horticulturist</i>	\$732 20
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TRANSPORTATION.

G. E. McIntosh, services and expenses	\$999 39
Miss Lester, services	165 00

COMMITTEES.

Directors' expenses—	
Dr. A. J. Grant.....	\$19 00
R. R. Sloan	30 50
C. W. Beaven	8 65
Geo. French	15 15
A. W. Peart	2 40
	\$75 70

PRINTING.

College Press, letterheads and envelopes	\$15 25
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MISCELLANEOUS.

Exchange	\$2 00
Dominion of Canada Guarantee, bond	10 00
Toronto Stamp and Stencil works	0 45
F. W. Adams, cheque returned	5 00
Postal note, Burlington (counter entry)	0 25
	\$17 70

Fruit Growers' Association of Ontario

ANNUAL MEETING

The fifty-fifth annual meeting of the Fruit Growers' Association of Ontario was held in the Carls-Rite Hotel, Toronto, on November 11th, 12th and 13th, 1914.

At two o'clock on Wednesday afternoon, November 11th, 1914, President Robt. Thompson, of St. Catharines, called the meeting to order.

PRESIDENT'S ADDRESS.

ROBERT THOMPSON, ST. CATHARINES.

I am delighted to see so many members present at this the opening session of the Fifty-fifth Annual Convention of the Fruit Growers of Ontario. We have not a fruit show as we had last year, not being able to secure the buildings owing to the fact that they are occupied by our gallant troops who are preparing to defend our country. We will possibly do more business than we otherwise would if we had the fruit show to attend.

The time for our annual meeting has once more rolled around, and finds us ready as ever to meet old troubles and face new difficulties and problems. The fruit grower has had a rather uphill road to climb during the year. First, the peach crop was badly injured by a sudden change in temperature on the 14th of January last, so much so, that in the Niagara District it was almost a total failure, in the Lambton District a partial, while Essex had almost a full crop on the few orchards that are of bearing age. Japanese plums also suffered everywhere. East of Toronto, cherries were a failure, while in the Niagara District the crop was large and prices very low. All over the province the apple crop has been good, especially on well sprayed and cared for orchards, but prices have ruled low. The depression in business and stringency of money in the early half of the year tended to keep prices low, and in the latter half the war situation has made things worse. While the grain, dairy and stock farmer has been receiving better prices, the fruit and vegetable growers have been getting less remuneration each month.

The Minister of Trade and Commerce, Sir Geo. E. Foster, is to be commended for his efforts in trying to advertise the apple and draw the attention of the public to the many uses to which it can be put, and in showing that it is a necessity and not a luxury. There has been some criticism as to the wisdom of this advertising, but it is not well to find fault with our friend's efforts; the fault, if any, lies with some of our people who have been talking as if all of the apples were going to waste, while as a matter of fact they are being disposed of very nicely, especially those from the better orchards. Attention should be given to the method adopted quite freely this season, of shipping a portion of a heavy crop in bulk cars. It would seem, if this were adopted for as many of our large towns and cities as possible, that the consumer would get a plentiful supply of good apples at a minimum cost, and the grower be enabled to do away with a lot of expense. Is it not time that Canada adopted a national dish for the table?

England has the roast beef, Scotland the oatmeal, and Ireland the potato, and other countries have theirs. We in Canada might well take the apple for ours, as in no other country does the apple flourish as it does in Canada.

We are sorry that the Fruit, Flower and Honey Show had to be abandoned. Preparations were on the way to have a greater display than ever before, but the buildings were required for our soldiers. The war we trust will soon be brought to a successful finish for the allies.

It would be well for the fruit grower to spare no pains in pruning, and getting ready for next season's work in spraying and cultivating his orchards.

The Fourth Dominion Conference of Fruit Growers was held at Grimsby, and much good should result from the addresses and debates on live subjects.

The fruit growers of this Dominion and this Association, have suffered a great loss in the death of our friend, the chief of the Fruit Division, at Ottawa, Mr. Alex. McNeill, one who always had the best interests of the fruit growers at heart, and who gave the best years of his life to fruit work. The Fruit Marks Act will stand as one of the monuments to his work and ability. May his remembrance stimulate many of us to strive to follow his example in unselfish devotion to everything that will tend to uplift and help the fruit interests of our Dominion.

We are pleased to welcome our old friend, Mr. D. Johnson, in his new position as Fruit Commissioner, and thank the Minister of Agriculture for appointing him. We look for successful efforts to be made in finding new markets, for assistance in furnishing improved crop reports and in making experimental shipments.

There has been considerable criticism as to Sir George E. Foster's advertising the Canadian apple, but if we look in the papers any day we can see that the manufacturers are having money used for that purpose, and it has certainly done a great deal of good. Some of the newspapers have put in articles that have been far from the truth. Some have gone so far as to say that the growers ought to gather the apples, ship them in and give them to the people in the city, as if the people in the cities have not as much money as the farmers to pay for the picking and packing of the fruit. A lot of harm has come from articles of this kind, but not from the efforts of Sir George Foster, and the work his Department has done. If these efforts were followed up by this Association, we would receive a great deal of benefit.

When the people know that they can get apples at so much per bushel, then they do not want to pay for the barrels, 45c. each. It certainly takes time and expense to pack the apples in a barrel, and it would be much easier to ship them in bulk. I am glad to say that quite a large number of small towns have taken apples in bulk this year. Places like Huntsville away up north have received apples in this way, and some have gone as far as Edmonton.

We should follow along the line of "Business as Usual" during the war. There has been some criticism to the effect that the farmers are not sending the same quota of men on the contingents as the cities. There are several reasons for this: first, the cities are getting credit for a number who are coming from the country. One young man from our own neighborhood who was working for me has been credited as coming from the city. I think the man who has business to attend to, whether in the city or on the farm, and who is employing other men should attend to his own business and should not go to the front except in very exceptional cases, because it will be necessary to keep up our credit and to provide food for those who are fighting, and to provide ways and means for paying the pensions and other expenses that will come up later on.

They tell us there is more grape juice drunk per head in British Columbia than any State of the Union, and that they are exporting large quantities. I am glad that we now have a factory for the manufacture of grape juice in our midst. We welcome the Welch Grape Juice Co., established in the Niagara District this season. May their business increase, and may more and more of the pure grape juice be drunk.

In conclusion I wish to thank you for the honor conferred on me in choosing me as your president, an honor that one may well be proud of, even if not sufficiently earned. I can assure you I will always be ready to work in the interests of the fruit growers.

REPORT OF THE SECRETARY.

MEMBERSHIP: The membership of the Association at the present time is 1,477, a gain of 115 over last year, and practically double that of 1909, five years ago. Of this number 1,386 are members through Affiliated Associations, there being 91 members who do not belong to local societies. There are between 57 and 60 local Fruit Growers' Associations in the Province, but only seventeen of these have affiliated with the Fruit Growers' Association of Ontario. This is a gain over five years ago, when only twelve local associations were affiliated. However, there are still 40 odd associations not affiliated. It seems almost impossible to get them to see the wisdom of uniting with us, though repeated efforts have been made.

COMMITTEES: The Transportation Committee, through Mr. G. E. McIntosh, has continued its valuable work, and at the Dominion Fruit Conference recently held at Grimsby, Mr. McIntosh was able to present a very valuable and instructive report covering the work done by him during the year. It is hoped that the investigation problems can be continued. The only difficulty in the way in the past has been finding sufficient funds to meet the extra expense incurred. The 1913 financial statement showed only a balance of a few dollars, but this year the finances of the Association are in somewhat better shape, so there seems to be no reason at present why the Transportation work should not be carried on.

INCREASED GRANTS: In view of the fact that heavier expenses than usual had been incurred by the Association through its transportation work, the Ontario Government voted the Association a special grant of \$500. This grant is for the current year only.

GRANT TO COUNTIES EXHIBITING AT THE HORTICULTURAL SHOW: At a meeting of the Directors of the Association on January 13, 1914, it was ordered that grants to above counties be discontinued. This was felt to be necessary partly in view of the financial state of the Association, and also partly that the work of Mr. McIntosh as transportation agent be continued at all hazards.

INCREASED MEMBERSHIP FEES: It has been felt for some time that the membership fee of the Association should be increased for members of affiliated societies. At the annual meeting of the Directors it was decided to ask the Association to pass a resolution that the fee be increased from 25c. to 50c. This increase was felt necessary, as otherwise part of the work being carried on by the Association would have to be discontinued from lack of funds.

MR. BUNTING: Before leaving the President's Address and the report of the Secretary, there are a number of matters referred to in them that are of considerable importance. I do not think it is possible for the Association to grapple with these points at the present time. Still, I think we would be derelict in our duty if we should allow these documents to go through without further consideration, and I think we should appoint a small committee to take into consideration the President's address and the Secretary's report, and that this Committee be requested to bring in a report. There are one or two things that I might refer to at the present time, namely, that we have only 91 members at large in connection with this Association, and that out of 60 or 70 Associations, only 17 are affiliated with this Association. That is a rather lamentable state of affairs, and I think some practical steps should be taken to remedy it. The Secretary also referred to the fact that there was only some \$8 on hand at the close of last year. He now shows that we have some \$900 to our credit. I do not think it is serious if at the end of the year the funds of the Association have been expended, provided they have been well expended, and I have no doubt that the funds were well expended during 1913. It is possible that a committee might make some suggestions as to future expenditure in connection with the Association. We should expend our money in the interest of the fruit growers, and we have a perfect right to call on the Dominion and Provincial Governments and the fruit growers of the Province for more funds if they are needed.

There were several very important points mentioned in the President's address that should have further consideration.

Moved by MR. BUNTING, seconded by MR. HAMILTON, that the President's address and the Secretary's report be referred to a Special Committee to be appointed by the Chairman. Carried.

A Special Committee as above was then appointed. Resolution and Nominating Committees were also appointed.

THE FUTURE OF THE FRUIT INDUSTRY.

D. JOHNSON, DOMINION FRUIT COMMISSIONER.

I am sure it affords me a great deal of pleasure to be present this afternoon at a meeting of the Ontario Fruit Growers' Association. It has been my privilege during the last few months to have visited most of the Associations in the Dominion of Canada. It has also been my privilege to meet many of the Fruit Growers at their homes or in their orchards and in some cases in their packing houses. I have had an opportunity of seeing things that I would not otherwise have seen. I am glad to be back again among the Ontario Fruit Growers, and to look upon so many familiar faces. It is not so long ago since I occupied the position of our worthy president, and I am very glad that the mantle has fallen upon his shoulders, because there is no man in Ontario who has taken a greater interest in the welfare of the fruit industry, and no man better prepared or more capable of discharging the responsibility which rests upon him. He has done a great deal not only for his own district but for the whole Province of Ontario. I believe the first experimental shipment of tender fruit to the Western Provinces was from St. Catharines, and Mr. Thompson, your President, was one of the leading men in bringing it about and since that time large shipments have been going forward, and they are the direct result of his work.

When I was asked to make an address at this convention I was not told what subject I was to speak on. However, I have prepared a paper which I will read, and if there is any point in it that you would like to discuss, I would be very glad if you would stop me and ask any questions you may desire. There is no better way for gaining information at a meeting of this kind than by a full and free discussion.

The season of 1914, will, I believe, pass into history as one of the most unprofitable that the fruit growers of Ontario ever experienced. The heavy frosts of last winter practically destroyed the peach crop and, while the strawberries and raspberries were fairly productive and prices good, yet right in the midst of the harvesting operations of tender fruit the gathering war clouds in Europe burst upon us in one of the most frightful wars the world has ever known, resulting in a panicky condition in all lines of commercial trade. Early in August all classes of business were seriously affected, especially any that had to do with articles that were looked upon as luxuries. The consuming public seemed to withdraw themselves for anything which looked like needless expenditure, and while the price of wheat advanced, the price of peaches, plums, pears and apples declined until at one time in the season it looked as if a most disastrous condition would exist.

I was in the State of Washington at the time, and was present at a meeting of representatives of American, Canadian and Australian fruit firms in Yakima, and found them all most depressed. The peach crop was then being marketed, and the result was that thousands of bushels of most beautiful peaches were allowed to waste upon the trees. Many carloads were shipped out with the expectation of making nothing more than expenses, while 35c. for a 20 lb. box was considered a good sale. These low prices declined until they reached 25c. per box, and as the cost of production is from 18 to 20c. per box a profit of only 5 to 7c. was realized on such sales. I raised the question with the shippers: would it not be more profitable to leave the peaches on the trees rather than ship them into the central States and north-western Canada on the risk of a profit of only 5c. per box? But they told me they were getting the cost of production out of the fruit and that was all they expected this season.

As for the apple crop it was freely predicted in Washington by growers and dealers that apples would not average more than 65c. per box f.o.b. shipping point. It was pointed out that since the declaration of war the German navy would be prowling about the sea, and the trade between Canada and Great Britain would be impossible, and as the United States shipped something like 17 per cent. of their fruit to Europe, that fruit would have to be consumed at home.

Nova Scotia, on account of the European war, would, it was believed, be unable to ship any of its apples to the other side, and would have to ship them back to western Canada. Ontario was in a like condition, and the whole situation was summed up by the Washington fruit growers and Association managers as follows: That the markets of Canada and the United States would be flooded with fruit and there would be no possibility of making a profit. On every possible occasion expressions of good-will and feeling toward Great Britain were freely made. But the power of the British navy was not known. That the German fleet would be bottled up and that American, British and Canadian commerce would be able to traverse the seas as in more peaceful days, was unthought of. Yet that is what actually happened. Instead of a general blockade, the people of Canada and Great Britain are consuming as much fruit as usual. I will not soon forget the discouraged feeling with which I was possessed after leaving Washington. As I returned to British Columbia the feeling was somewhat more optimistic, but it was a discouraging

sight to see thousands of bushels of beautiful peaches wasting on the trees simply because people would not buy.

Upon my return to Ontario about the 1st of September, I found conditions much more hopeful than they were in the West. The cost of producing the fruit was not so great, such unreasonable prices had not been paid for orchards and marketing problems were more simple, and the power of the British navy was being felt in the establishing of commercial relations between Canada and the Motherland. However, the consuming public would not buy, and although the plum crop was only some 25 per cent. of that of 1913, yet that 25 per cent. was as hard to sell as the full crop of the previous year, and the prices little if any higher. The peach crop was almost a failure, not one-tenth of 1913, and yet the great mass of people would not buy peaches owing to the panicky feeling which existed. Factories were closing down, mills were running half time, mines were not operating, and the working man was hoarding the little money he had. This was the condition in which we entered the apple season of 1914, with one of the largest crops that Canada has ever produced and perhaps the finest in quality.

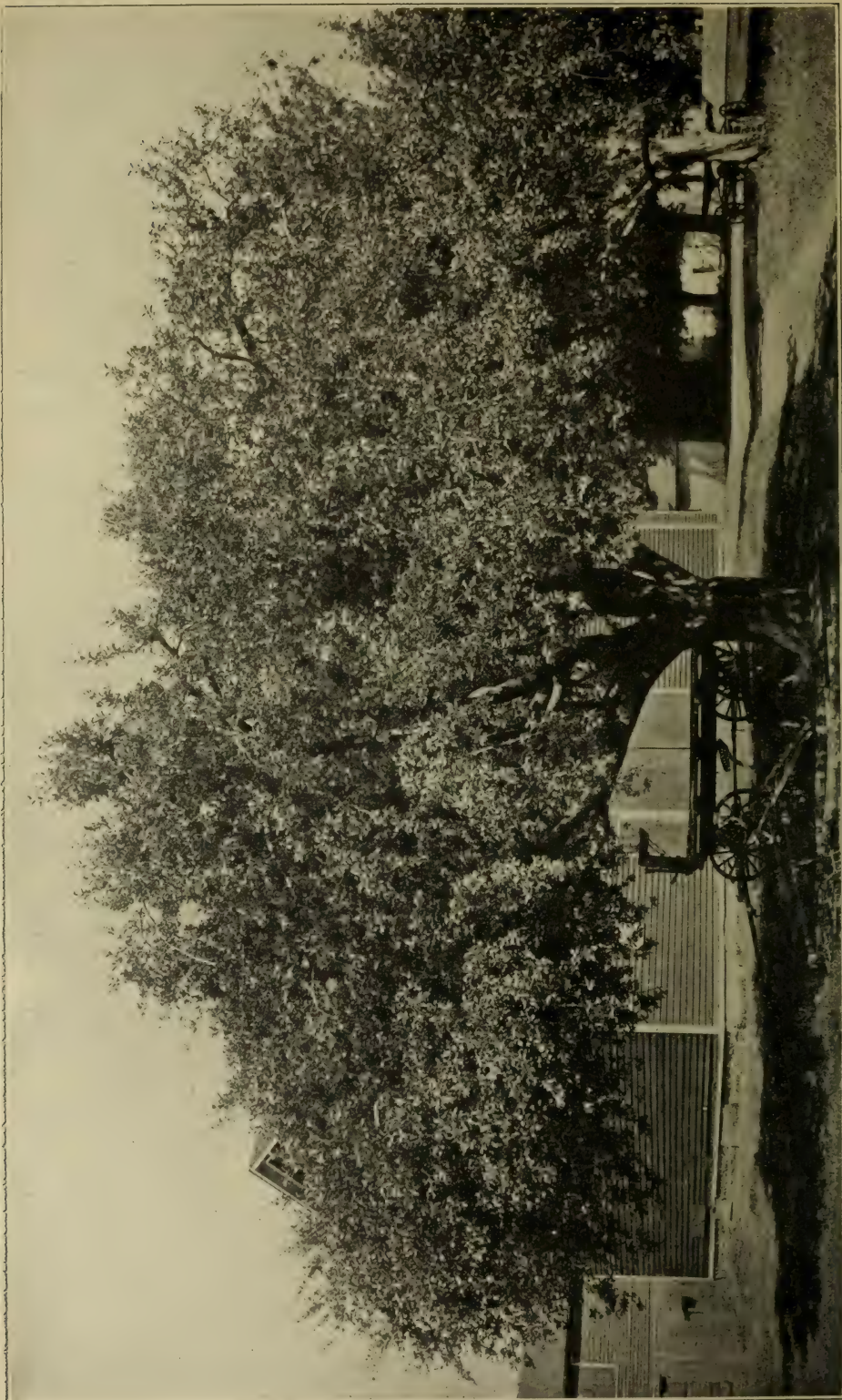
European buyers who up to this year had been a most important factor in the harvesting of the apple crop did not appear, the banks would advance but little money, and the fruit growers were thrown upon their own resources, resulting in thousands of barrels of good apples wasting in the orchards, with the exception of those localities where co-operative associations existed, or where some shipper had some connections with the trade in former years which stood him in good stead now. This year, above all seasons, has justified the existence of co-operative associations. These associations have had their ups and downs. They have had their encouragements and discouragements, and have passed through good seasons and bad seasons. While this may be their history for the past few years of their existence, yet it is an undoubted fact that they have increased the sales of orchard lands in the districts in which they are established in many cases 100 per cent. and have caused their members to take a keener and more intelligent interest in their orchards. Production has been more than doubled and growers have realized for their apples about 50 per cent. better prices than were formerly paid. This has been the history of co-operative associations in the past. Their record in 1914 will be even more striking. It has been my privilege this season to examine the packs of most of the associations, and nearly all have reflected credit upon the organization. Growers who are fortunate enough to be members of these associations have been able to market their apples through their associations, either by f.o.b. sales or on consignment, in carload lots, in such a way as to make a fair profit on the season's operation. In some districts I have seen large crops of fine apples wasting in the orchards or being devoured by the hogs, while apples of no better quality are being sold at from \$2 to \$2.50 per barrel f.o.b. shipping point by the co-operative association to which the grower belonged.

In the early days of co-operation some ten years ago, when the late Mr. McNeill first started to preach co-operation among the fruit growers of Canada, he was severely criticized in some places, and the ground was taken that the buyers would be put out of business. But the history of the movement for the last few years has proven that the local apple buyers were unable to take the risk of handling fruit to the same extent that an association could. The risk this year was altogether too great for them and they did not appear at all. The result was that a large percentage of the fruit which they formerly handled was not harvested after it had been produced; on the other hand, the associations, the co-operative organizations of the farmers, still exist and have marketed to the best of their ability the crop of their members.

In watching this season's operation it has been driven home to me more and more that for the great bulk of apples there is too great an expense from the orchard to the consumer. I do not for one moment wish to criticize the reasonable middleman or insinuate that there is not a place for well packed apples in boxes and barrels. Well packed fruit cannot be too much encouraged and will receive all possible assistance from the Dominion Department of Agriculture, but is it not a fact that Canada herself is not consuming the amount of apples that she should? I think I can say without the slightest hesitation that not one-quarter of the fruit is being consumed in our cities that would be consumed were it not for the expense of placing it in the hands of the consumer. The well-to-do people will always buy apples in barrels and boxes, but the working people cannot afford to do this. They may buy a barrel or a box, but they will not be able to eat the quantity that they desire. In fact I believe that 50 per cent. of the population of our cities are scarcely touching apples at all, and those who are using them are not eating half as many as they should. Believing this, the Government undertook an advertising campaign this fall to try and attract the attention of the masses to apples. This campaign was carried on for seven weeks at an expenditure of something over \$12,000. The result has been that something like 36,000 letters of enquiry have been received asking where apples can be got, and how they should be served. Of course, it is impossible for the Government to advertise any particular pack of apples or any particular price. If the growers themselves had reinforced the campaign by definite advertisements as to the price and quality of apples which they could offer I have no doubt that it would have assisted tremendously in the marketing of the crop. As it is we are advised by wholesale and retail dealers all over Canada that the demand was greatly increased by the efforts put forth in that way. The fact that so many enquiries were received is also a good indication that the public are giving attention to apples. In Washington I was told by a large association that by the expenditure of 10c. per box in advertising on a certain number of carloads of apples they increased the net price 25c. per box, or in other words, an expenditure of 10c. brought them in 35c.

We know what has been accomplished by advertising in western land booms which have attracted attention from all parts of the world, filling the country with an industrious population and increasing land values two or three hundred per cent. We also know what advertising has done in increasing the consumption of bananas and oranges in Canada. It is an alarming fact that while apples have not increased in consumption, yet the imports of these fruits have increased in value from \$1,891,539 in 1903 to \$6,525,518 in 1913, an increase of 325 per cent. in the last ten years (or 35 per cent. each year.)

In view of these facts I think the time has arrived for the Canadian apple growers to proclaim to the world through the medium of advertising, the value of their products. And, while we would not advocate the adoption of all the methods by which advertising has increased the price of certain commodities, yet the principle of advertising is right and could be followed with equal advantage to producer and consumer; and I believe that if the various associations had this year set apart 5c. or 10c. per barrel for advertising purposes they would have brought their names prominently before the public and would have secured for themselves a good reward for the expenditure. In addition to the home market there are also the great fields of Europe to be exploited, South America, Australia and South Africa, in which a vigorous commercial and advertising campaign would bring an enormous increase in the consumption of our fruit.



A fine Spy tree in the Orchard of Norman Moyer, Jordan Harbor. In 1910 the tree had a spread of 60 feet, but the branches have since been cut back to a 50-foot spread. The circumference of the trunk at 3 feet from the ground is 8 feet. Last year it bore a crop of 20 barrels of packed apples, exclusive of culls.

The marketing of apples at the consumer's end has made no progress in the last fifteen or twenty years. There has been no effort on the part of the producer to get closer to the consumer. Something of this kind was strongly brought to our attention a few days ago in the city of Ottawa. A carload of apples was bought in Prince Edward County at 25c. per barrel on the trees. The apples were picked and loaded by the buyer in bulk form on board the car, piling the apples some 2½ ft. deep. The apples were shipped 150 miles and sold to the retail trade in Ottawa at \$1 per barrel. These apples were turned over to the consumers at from \$2 to \$3 per barrel. The fruit arrived in good condition, and was just the class of apples that the great majority of the consuming public of our cities are looking for. They would keep well on into the winter, and would meet the needs of the great bulk of our consumers; but the fruit should have been placed straight to the consumer instead of to the horde of peddlers, hucksters, etc., who largely control the fruit trade of our cities. The great question in my mind at the present time for the fruit growers in Ontario to consider is how can we bring the products of our orchards to the consumer at least possible cost. Money and energy expended in this way will, in my opinion, bring greater results to the province as a whole than large plantings of orchards at the present time.

I can see no reason why a step forward in the organization for handling our apples should not be taken. We took advantage of the opportunity a short time ago of pointing out in the press the chance for municipalities, charitable institutions, factories, etc. to go to the orchard districts and buy their apples direct from the producer. These apples could have been placed on board car at the least possible cost, in bulk form, and conveyed to the cities, and given to the consumer at a much lower price than he is paying at the present time. In this connection I may say that last week the City Council of Ottawa imported a car of apples from Western Ontario, some 400 miles distant, giving the apples to the consumers at a price of \$1.30 for the contents of a barrel delivered in their cellars in bags. A single notice in the papers was sufficient to sell the car before it arrived. Thus the producer got a fair price for his apples and the consumer got his fruit at less than half what he was paying for expensive packages when he bought through the regular channels of trade. I have no hesitation in saying that this year at least twice as many apples could have been used had transportation charges and the net profits of the producer been the only costs to the consumer. This question opens a great field for operation, and I trust that the thought and energies of our progressive growers and organizations will be concentrated on an effort to eliminate the cost of operation between producer and consumer. Something along the line worked out by the city of Ottawa would, I am sure, be worthy of careful consideration. If we do not take some steps to increase consumption there is no doubt in my mind but that over-production will soon result. During the past season it has been my privilege to travel some fifteen thousand miles among the fruit growing districts of Canada and the Western States. A great deal of that distance has been covered by motor among the orchards and farms, so that I have had a fair opportunity of judging the extent of our orchard lands. I knew before that Canada had some twenty-five million fruit trees, but had never realized what these figures meant until I came in contact with the orchards. Then it was pressed home to me that, unless consumption was greatly increased, there was a day not far distant when Canada would be face to face with over-production.

In the famous Annapolis Valley of Nova Scotia not more than 50 per cent. of the apple trees are bearing, and those that are bearing are still young and far from

yielding their maximum amount of fruit. The orchards are situated in a valley some 100 miles long and an average of over 6 miles wide. In this valley apples are the main product of the land, and the good care that the growers are giving their trees assures us that Nova Scotia will yet produce twice as much and perhaps four times as much before many years. New Brunswick is also planting, and on the sloping bank of the St. John River are thousands of acres of young orchard that are not yet producing. Quebec is forging to the front once more, and many acres of Fameuse and McIntosh Red are there producing apples of superb quality and appearance. With conditions in Ontario we are all more or less familiar. We know that in some districts plantings have greatly increased while in others San Jose scale has wiped the orchards out of existence; but I think you will agree with me that one-half of our 10,000,000 apple trees are not yet bearing. It is only necessary to drive up and down the concessions of the fruit producing districts to be convinced that our orchards are just beginning to produce.

British Columbia was a great surprise to me. I had often heard of the orchards there, but when brought face to face with them it was a revelation. I travelled hour after hour through solid orchards, kept in fine state of cultivation. It is true that they are only producing some 1,000 car loads of apples this season, yet this is only a beginning, as two-thirds of the trees are under five years of age and the other third practically only beginning to bear. The Northwest States of Washington, Oregon and Idaho are in a like position, producing now some 15,000 cars. In view of these facts, I can only ask you as I have asked myself time after time: What of the future? The answer, to my mind, is the extension of markets and the use of modern advertising to increase consumption both at home and abroad, and, also, the adoption of some cheaper method of handling the fruit from producer to consumer in order to give the great bulk of our population a chance to eat apples, which is, of course, only another method of increasing consumption.

A MEMBER: What did the consumer pay for these apples that were delivered in Ottawa at \$1 a barrel?

MR. JOHNSON: From \$2 to \$3 a barrel. When he bought them by the barrel he got them for \$2, but when he bought them by the peck he paid \$3 and more. This is caused to a great extent by the middlemen.

A MEMBER: When these apples are shipped in bulk are the different varieties mixed together?

MR. JOHNSON: No, the different varieties are kept separate. Six inches of straw was put in the bottom of the car and the car was padded on the sides. The apples were bagged up in Ottawa by hand which cost 2c. a bag, and the bags cost 5c. each.

Q.—Would not they carry right through in bags?

A.—I am doubtful about that; I think they would rub together. These apples sold for 65c. a bag and I think the council are going to have a good profit on them. They were tree-run.

MR. LICK: What quantity of apples did they get in a car?

MR. JOHNSON: 30,000 pounds.

MR. LICK: What price did the grower get for these apples?

MR. JOHNSON: 40c. a hundred, delivered at the car. I am not pointing out to you that the grower made a fortune out of these apples, but I am pointing out to you that they could have been placed in the car and sold at a higher price than that, and that they would arrive in good condition. One single notice in the paper was sufficient to sell the car before it arrived, and I believe the money was put up before the apples arrived.

DR. JESSOP, St. Catharines: What is the area of the Annapolis Valley?

MR. JOHNSON: It is 100 miles long and 6 miles wide. The Okanagan Valley is about the same size, but is not all in orchard yet. They have thousands of acres of young orchards planted there by commercial companies which are being looked after wonderfully well, and they seem to be fully alive to the necessity of holding on for a few years. I think in a few years, British Columbia will be a factor in the market. At the present time, they have only 1,000 cars, but five or six years ago they were practically nothing at all. If they continue to increase as they have been, we will have to extend our markets.

MR. BUNTING: Don't you think these companies have sold some of this land to individuals in some cases absentees, and a large percentage of these orchards will go back?

MR. JOHNSON: There is no doubt that there are a number of companies and individuals that have settled right down to grow fruit. The Belgian colony is a very important one. They have planted tremendously and are very industrious.

Our inspectors in the Western Provinces have advised me that a good many car loads of apples in bulk have arrived in the West and were selling at a fair price. I think this will be a means of increasing the consumption of fruit.

LORNE H. CAREY: The ordinary consumer thinks that the grower only gets 30 or 40c. a barrel for his apples and they object to paying \$3 and \$4 a barrel. It should be clearly pointed out that these are bulk apples. I started a campaign in Hamilton. We were getting \$2 per barrel, and I figured at 10c. for freight into Hamilton, 15c. for canvassing the city, 10c. for warehousing and advertising, 10c. for delivering from the warehouse to the house, and 5c. for collection; that brought it to \$2.50 per barrel delivered to the householder. I started canvassing at that price, so as to see whether the people were prepared to buy barrelled apples, and the result was that we got 43 orders and we gave it up. Not only that, but somebody wrote a letter to the paper and said that the local associations were trying to sell apples in the city at \$3 a barrel and that the Government should take charge of them. We were offering to sell the local consumer barrelled apples at the same price that we were getting for them in car lots, but they would not buy them. I think it should be fully explained that apples that are bought cheaply by the consumer are not the expensive barrelled apples. Very few people will hand pick apples and dump them into a car. Most of the growers get 65c. and 75c. for No. 1's and 2's on the trees.

MR. PATTERSON: I was manager of a fruit farm and we sold most of our apples at Hamilton, 400 barrels. I was also concerned in a large apple proposition in Northumberland County, and we sold 5,000 barrels f.o.b. cars, and I was up against some of the propositions Mr. Carey has described. I had no difficulty in selling No. 1's and 2's in Hamilton for \$2.25 to \$3. These apples were sold to people who were fairly well to do. The campaign in the papers has been productive of a great deal of good, and some little harm. Some dealers have stated to me that they found it very difficult to sell barrelled apples because the people said the Government were advertising apples at \$1 per barrel. We sold our 5,000 barrels in Northumberland for from \$2.25 to \$3 on the switch. Half of them went to Winnipeg and the other half to Calgary. The people in the city have an idea that the fruit grower is going to run around and hunt them up in order to supply them with cheap fruit; they are mistaken in that; if they want cheap fruit they have got to do something themselves in order to get it. The farmers may be charitably in-

clined at all times, but they cannot be asked to part with their crop for nothing any more than the city merchant could be asked to part with his stock for nothing.

MR. D. JOHNSON: As to the public getting the idea that they can buy apples for \$1 a barrel, that should be blamed on the newspapers and not the Department. The campaign was started early in the season, and we found a number of cars arriving at Ottawa and being sold to retail merchants at \$1 a barrel in bulk. I told Mr. Burrell about it, and he said it was a shame that we should be getting so many letters from the country saying the apples were going to waste in the orchard, and that the consumers were paying \$2 and \$3 a barrel for apples which are being bought for 25c. a barrel in the orchard. Dr. C. C. James and myself drafted a letter showing the possibility of buying apples in bulk form; we were careful to say in bulk form. We handed that letter to the newspapers and the next morning they came out with big headings saying that Fruit Commissioner Johnson said that apples could be placed in the consumer's cellars at \$1 per barrel. As a matter of fact I did not say any such thing, but I did say that apples in "bulk form" could be placed in the consumer's cellars at \$1 a barrel. I wrote a short article pointing out that what I wished to impress upon the people was that they could buy bulk apples at \$1 a barrel, but unfortunately the newspapers only published part of that article. I have made very careful inquiries from the Atlantic to the Pacific, and I am told that the consumption of apples has been much larger than formerly, and the publicity that has been given to the apple question has been responsible for it more than anything else.

MR. BUNTING: I want to draw attention to the differences in apples; there are apples and apples. We have been endeavoring to raise the standard of our apples, and we have got to the position where the average grower feels that if his apples do not come up to a certain standard they are entirely unmerchantable, and they allow them to rot in the orchard. I do not think that is right. I think this question of bulk apples would cover that situation, and if the demarcation was clearly defined, and bulk apples are not to be considered as apples picked according to the Government standard, perhaps the atmosphere would be clear. We are not in the business of delivering apples into the cellars of the consumers.

MR. ROY CAREY: I sold something like 2,000 barrels of apples in the city of Toronto alone, and they were delivered to over 1,500 homes. Some people in Toronto that our agents would call on when asked to pay \$3.25 for a barrel of No. 1 apples, would throw up both hands and say, "I just read in the paper where Mr. Johnson said we ought to have first-class apples for \$1." We would tell these people all right, we will give you apples at \$1, but we will have to ask you 50c. for the barrel, and we took orders for apples to be delivered in the cellar at \$1 a barrel in bulk. We got orders for about 150 barrels in that way, but the people wanted the No. 1 apples, and they were willing to pay \$3.25 a barrel for them.

MR. ROY CAREY: Last year I shipped 18 cars of bulk apples to Montreal on the same plan that Mr. Johnson has been speaking of, and this year I shipped 12 cars in the same way, and they worked out quite satisfactorily. We do not ship the No. 1 or No. 2 in bulk.

MR. PATTERSON: There are many varieties of apples outside of the Spy that are good apples. I have done a lot of campaigning in selling apples lately, and I find that 99 people out of 100 want Spies. A great many people do not understand they should not buy Spies in October and November; they should not be used before Christmas. The Greening and other apples are admirable cooking apples, and I think they should be advertised to a greater extent.

MR. D. JOHNSON: The advertising agency has been under the Department of Trade and Commerce, and this matter was turned over to Mr. Gibbons, and they attended to the advertising, and I pointed out to them that other varieties of apples should be extensively advertised as well as the Spy.

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CITRUS FRUITS AND BANANAS IN RELATION TO MARKETING OF ONTARIO FRUITS.

PROF. J. W. CROW, O.A.C., GUELPH.

What I have to say will be more in the nature of a continuation of the discussion which you have so much enjoyed. The points that have been going through my mind are very much those which have been presented to you by the Dominion Fruit Commissioner in his excellent summary of the situation. It is quite evident that the market problem is a serious one. It would appear that we have reached the point where we can scarcely feel like advising a man to plant apple trees. We are not talking at the present time about planting apple trees, but we are talking about selling the apples that we are now growing, and that is what you might call a new phase of the apple industry.

For some years back we have been boasting and boasting of the apple business. We have evidently got a little past that, and we have now come to the problem of selling the fruit that is in our orchards. So far as the marketing end of the problem is concerned, I feel that the Commissioner is correct in his conclusions as to the proper remedy. He sums his argument up in this way, "What we need is an extension of markets." That is to say, we must cover a wider territory. We all agree with that. We all see that our markets can be extended. The Commissioner referred to the possibility of increasing the consumption by means of advertising. The discussion which has taken place has referred more particularly to the matter of retailing and to the possibilities there may be of distributing apples in the cities at the least possible cost. We have not realized just where the sticking point is in the distribution of our apple crops, and it might assist us to a proper conclusion if we straightened out our ideas on that particular point. To my mind the power of advertising and the benefits which can come from it are very great indeed. Advertising is the only means the producer has at his disposal for increasing the consumption of fruit. The idea Commissioner Johnson has presented to us in regard to the shipment of bulk apples is a very good one in a case of emergency such as we have had during the present year. So far as I can see there is no possibility of a Producers' Organization entering into the retailing of fruit. No co-operative association that I know of has ever made any serious efforts to conduct a retail business. I do not believe it is possible, practicable or desirable for any of us who are interested in the production of fruit to get into the retail end of the business. We ought to realize that that is a separate part of the business. And we ought to realize that when apples are sold in Western Ontario at \$1 a barrel, or when they are landed in Ottawa at \$1 a barrel and sold at \$2 to \$3 a barrel, that looks like an unnecessary profit, but we fail to realize that that is the customary thing in regard to the selling of any product. I mean by that that the retail price of almost any product is ordinarily about double the wholesale price, and that means if you carry it out that the expenses in connection with the distribution of any of our farm products are very great. Mr. Johnson intimated that there must be an immense profit in the push-cart business. I venture to say it is very small, because the

cost of conducting the business is very large. You may think that because the grocer charges you twice as much as the wholesale price for a can of peas or beans that he is making a large profit, but that is not the case. It costs money to handle these things, and I doubt if they could be handled for any less under our present system. The only people who are actually marketing food products at any considerable saving in the cost are the large departmental stores. By virtue of the fact that they handle large quantities and have a complete delivery system, they can do it at less cost than other people. If you will only think of the number of retailers that there are in the city of Toronto.

A MEMBER: There are 1,400 fruit stores including foreign stands.

PROF. CROW: You are not counting the grocery stores.

THE MEMBER: All who handle fruit including grocery stores; that is a list taken from *Might's Directory*, that won't cover hucksters.

PROF. CROW: How many of these retail dealers could be eliminated by a proper system of distribution? How many retailers would it take to make up the volume of business that is done by one of our big departmental stores? The profit of the retail business is not high when you consider the large number of men engaged in it. Very few men are making a fortune out of it. It is the easiest thing for a man to get into and the easiest for him to get out of. As a general thing the retail men are crowding each other to the limit, and no one man is making a large fortune. As Mr. Patterson has very correctly said, that is a problem for the consumer. I do not think we as fruit growers have any occasion to worry about the poor consumer in the city. When I say that I do not include people who are in want. That of course is a different problem. We will sacrifice and do sacrifice for the needy poor. In years past the consumer in the city has said, "Bring your stuff along and get your money." Things are somewhat pinched at the present time, and the situation is somewhat changed, but until the consumer in the city gets pinched to the point of necessity, he will go right on in the same old way. Some day our civic Government will realize that the question of marketing is a public one and not a private question, and they will establish civic markets and have them properly controlled. When that time comes, the consumer in the city will be protected, and the consumption of farm products will be increased, and the general situation of all concerned will be very much improved. The grower follows the apples up to the point where they reach the wholesale market—that is controlled by the law of supply and demand. We can to a certain extent effect a saving of cost up to that point. Starting from the wholesaler, on the other side of the fence, the apples go through two or three hands before they reach the consumer, that is the consumer's side of the fence. We cannot influence to any extent the consumer's side of the problem except through advertising. We can make known to the consumer what fruit is available at a given time and what fruit will be available next week. We can let them know what price should be paid and the quality. We should not allow winter apples to be used up in October; that is not good business. We should educate the consumer on these points. Consider some of the advertisements which you are familiar with—take for instance Cream of Wheat or Shredded Wheat. Ask any groceryman how much profit there is in Shredded Wheat. These articles are advertised to such an extent that people believe in them and demand them and the result is that the groceryman is forced to carry them in stock at a small profit, and he has to make up his profit out of staples. That, I think, is a fair example of what is possible by advertising. We can get our fruit crops to the consumer by advertising, but we cannot get to him any other way. I do not know whether we can get to the consumer by lowering

the price of our apples, because as you know the price the farmer receives goes away down before there is any reduction whatever in the retail price. The first cut made in the price of apples is the cut in the price paid to the farmers, and the last cut is from the retailer to the consumer. Therefore, I do not think we can do much by lowering the general wholesale price of our products. I hope the beginning which has been made in advertising this year will continue. A great deal of good has been done by it.

One point I would like to mention which has developed out of the present situation. People are using more apples than ever before. There is a very good reason for that; apples this year started at a low price and the people began to use them. The result is that in some lines the apple market is already cleaned up. I am told that in the vicinity of Montreal, the farmers are receiving as high as \$4.50 a barrel for No. 1 Snows; three weeks ago these same apples were selling on the market for \$3 per barrel. They are going up, and they will continue to go up. The point I want to make is, that every time in the history of our apple crop when the price has been moderate at the beginning of the season, apples have moved into consumption and have been used up, and invariably, prices became higher; but when apples start at a high figure in July and August, they are held back and move slowly, and a great many go into storage and come on the market after New Year's with a rush and the price goes down, and nobody gets any apples to eat and everybody loses money. There have been cases where with a light crop of apples, the price has started high in the fall and has gone to smash in January or February.

Speaking of the subject which appears before my name of "Citrus Fruits and Bananas in Relation to Marketing of Ontario Fruits," there is something of interest to be derived from a study of the market system of citrus fruits which are placed on our markets in such large quantities. I have the following figures from the Commissioner of Customs at Ottawa relative to the quantity of these fruits imported into Canada annually. The figures I have here give the quantities imported into Canada during the fiscal year ending March 31st, 1914. I have the value and not the number of car loads:

Bananas	\$2,663,453.00
Lemons	973,531.00
Oranges and Grape Fruit	3,630,329.00
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Total,	\$7,267,313.00

I estimate that the oranges and grape fruit combined would make about 1,600 cars of fruit. I am told there are about ten car loads of oranges a day coming into the Toronto market at the present time, and they go into consumption right away, and this in spite of the fact that the apple season is at its height. How do you explain that? There are very good reasons which can be given in explanation of the present situation, and of the large quantity of these fruits which are used in Canada. One is the value of the product. I mean by that the value as compared with other products which are on the market for a similar use. When it comes to the question of dollars and cents value in terms of food supply, the banana is the cheapest fruit on our market by long odds. Our apples do not compete with bananas successfully on the question of food value; they are away below the banana in food value. Oranges in one sense are ahead of the apple and in another sense they are behind. The consumer can buy a small quantity of oranges and there is very little waste; as a rule the product is uniform, well ripened and satisfactory to use. When a

consumer buys apples he has a more difficult problem; he has to consider the wastage which results from carelessness in handling or because the fruit is too ripe. In actual food value per pound, apples are superior to oranges, but there is quite a loss in the weight of apples between the store and the table. I have no doubt you have all been convinced of the fact that oranges and bananas are to a large extent sold in Toronto from fruit stands and stores. They also sell apples, but the apple takes third place in the fruit stand. It is also true that there are large quantities of apples sold from grocery stores by the basket and box and sometimes by the barrel. The fruit supply of Toronto does not depend on the fruit stand by any means. I asked one of these men the price of apples and he said three for five. I asked him how many more apples he would sell if he sold six for five, and he said, "The buyers do not come fast enough." That is to say he is selling all the apples he can at the present time, and he is getting what the consumer is willing to pay. The fact of the matter is the consuming public takes oranges and bananas at the fruit stands in preference to apples.

The banana comes first in food value, and I have intimated the difference in value between the apple and the orange, and the orange is a foreign product and in a sense novel. I do not know to what extent that counts.

MR. ROBERTS: The dealer would sell more apples if he was willing to take the same profit.

PROF. CROW: Apples are more perishable in the fruit stand trade than oranges. An orange can be left on the tree for a month or two months, but you must pick an apple when it is ready to be picked or it will fall to the ground.

MR. HAMILTON: I am in an orange growing district, and this year I marketed my oranges, and they are now sold. Last year they were not marketed until March. Everyone of these oranges is polished and scrubbed; they are all selected.

PROF. CROW: I would like to ask what percentage of a well-grown orange crop are culls.

MR. HAMILTON: A very small percentage. An orange that falls on the ground is left there; it is not saleable. All the oranges that come into the Ontario market must be in perfect condition. I can plant bananas on my plantation in Florida and get a crop the following winter. It is just like growing potatoes; they can be produced cheaply.

PROF. CROW: I am told the customary price for bananas in Jamaica at the present time is 15c. a bunch, and there are from six to ten dozen on a bunch.

DR. JESSOP: That is so, you can get a large bunch for 15c.

MR. HAMILTON: There is no expense in packing them; they are just brought in in bulk.

PROF. CROW: I want to say to you that the biggest saving that can be made on the grower's side of the fence is in the elimination of cull apples; that can be brought about in several ways. The most important point in orchard production that I can think of is that of thinning, and I cannot imagine why our growers will continue to produce from 25 to 40 per cent. of unsaleable fruit. I call fruit unsaleable which is only fit to go to the evaporator.

Bulk shipments are a necessity under present conditions. I contend that the money in the apple business is in the production of better fruit; we must grow a higher product, that is the only way in which we can make money. We are continually admonished to pack better fruit and to put our apples on the market in better condition, pack apples that are well colored, free from worm holes, and the only way to do that is to grow that kind of apples. Some think

that the association manager is in a position to raise the standard of the pack. What do you suppose is going to happen to the association manager who holds back 15 to 25 per cent. of any man's crop and says they are unsaleable? That manager will have to look for another job. The association manager cannot, of his own effort, raise the grade of apples above a certain point. The associations that have been most successful in Ontario up to the present time are those that have admitted to membership only men who grow first-class apples, and who hold each individual member responsible for his pack. A member cannot pack first-class stuff unless he has got it. The British Columbia growers are our most serious competitors. They are putting up high grade fruit, and they are sending it on the market well graded and packed. From the beginning, in British Columbia, they have not put up fruit in the way we have; they started right. I know that it is said that the British Columbia pack has not improved of late years, but it is away ahead of the Ontario pack on the average. The chief factor in the high product from British Columbia is in the growing of the fruit.

A MEMBER: Weather and local conditions have a great deal to do with it; they are less liable to have small apples than we are.

PROF. CROW: They can irrigate their land and keep their trees growing when they are young. If you will run over the men in Ontario who are making money from growing apples, you will find, without exception, that they are men who are growing good fruit. They are spending money on their orchards and are getting a high grade product in return.

Mr. Johnson, Mr. Kydd, and myself got into an argument this morning and I came out ahead, and I want to give you some of the figures, and I want you to take your pencils and put down the value of 100 barrels of apples orchard run, grown under ordinary conditions without thinning; 25 per cent. of these apples are culls. You can put down 25 barrels of culls; 60 per cent. of the balance we will estimate as No. 1, and 40 per cent. No. 2, that leaves us 45 barrels of No. 1, 30 barrels of No. 2, and 25 barrels of culls. Taking figures for an ordinary season, we will receive \$2.25 per barrel for No. 1, \$1.75 for No. 2, and 10c. per 100 on the tree for the culls. We allow \$1 a barrel for picking and packing and drawing to the station. That gives us 45 barrels at \$1.25, \$56.25; 30 barrels at 75c., \$22.50; and 25 barrels at 15c., \$3.75—making a total of \$82.50.

Now we will take that same theoretical 100 barrels of apples and thin them, and we will imagine that by thinning it is possible to get 90 per cent. of these apples fit to go into barrels, and we will allow 10 per cent. for culls, which is a high percentage—that means that you will have 90 barrels of apples. It has been admitted that by thinning it is possible to get 85 per cent. of No. 1's; that would be 76½ No. 1's, 13½ No. 2's, and 10 barrels of culls.

MR. BUNTING: You are taking it for granted that by thinning you will get 100 barrels from the same trees.

PROF. CROW: Most assuredly; there will still be 100 barrels of apples after they are thinned. Under some conditions you take off 50 per cent. of the apples, but ordinarily you take off from 15 to 40 per cent. The increase in size makes up the bulk.

MR. DAVIS (Ottawa): We remove 10 per cent. without decreasing the yield of the tree, counting the number of apples taken off and the number picked and all the windfalls. These trees that were thinned, had they not been thinned, would have produced exactly the same number of apples per barrel as the unthinned

trees. For instance, if the trees that were not thinned gave 648 apples per barrel then divide the total number of apples which came off the thinned trees by 648, that gave us the yield they would have given us if the apples had not been removed.

PROF. CROW: Do you think that is a fair way to compute?

MR. DAVIS: Supposing a tree that was thinned had in the first place 20,000 apples on it, and by removing 2,000 apples and leaving 18,000 apples on the tree, we found at the end of the season it produced 10 barrels, and if the 20,000 had been left on the tree they would have produced 10 barrels. The increase in size made up for the 2,000 apples that were taken off. We find that taking off 10 per cent. of the apples increases the size.

PROF. CROW: Were these trees heavily loaded?

MR. DAVIS: Yes. There is no doubt we made a large profit from the thinning; we got a larger percentage of No. 1's and 2's, and when we shipped to England and sold on their merits, the 1's and 2's from thinned trees in every case brought 25 to 30 per cent. more, simply because they were magnificent 1's and 2's.

PROF. CROW: How many culls did you have off the thinned trees.

MR. DAVIS: Very few; it would not be over 10 per cent. I think out of 11 barrels of apples we had one barrel of culls. We had a large per cent. of culls on the unthinned trees.

PROF. CROW: There are many cases where we had to take off 25 per cent. Ten per cent. is a small percentage for varieties like the Spy and the Baldwin

To conclude the theoretical computation we started with: These 100 barrels at the prices used in the previous figures came out in this way:

76½ No. 1's	\$95 62
13½ No. 2's	10 12
10 barrels culls	1 50
	<hr/>
	\$107 24

or \$24.74 on 100 barrels of apples due to thinning. It has been suggested that I must charge up the cost of thinning. Some people maintain it cannot be done for less than 10c. a barrel.

MR. DAVIS: It can be done for 30c. a tree.

MR. KYDD: What do you pay that man per hour?

MR. DAVIS: I am charging my time at 20c. an hour. You can thin a big tree in an hour and a half.

MR. KYDD: How many barrels will these trees grow?

MR. DAVIS: Five barrels to the tree.

MR. KYDD: What do you use to thin them with?

MR. DAVIS: A small hand snipper that is sold for the purpose. There are springs on them and the snippers open of their own accord. How long do you leave your apples on the trees before you start thinning them?

MR. KYDD: We want to leave them long enough so as to be sure that we are leaving the best apples on the trees.

MR. DAVIS: I have never had any trouble in thinning, and I would like to get 10c. a barrel for doing the work.

PROF. CROW: I am perfectly convinced that thinning is something we will have to do in the future. You can produce the apples for 23½c. a barrel less than if you do not thin them, and you can afford to sell your apples for 23½c. less a

barrel and come out where you would have been if you had not thinned, and we will be establishing a better grade of apples, and that is where you are going to improve market conditions. That is one point I want to leave with you.

MR. KYDD: Just to answer what Prof. Crow has said about thinning apples. This year we had quite a number of Wagener apple trees, and we thinned these trees with the idea of carefully counting the cost of thinning, and keeping track of the number of apples that came off. On the thinned trees you would have said that every apple looked like a No. 1, and on the unthinned trees they were mostly all culls. The Wagener is one of the varieties that must be thinned. There are two or three varieties of apples that I do not think a man can make a success of unless he thins them. They are the Snow, the Wagener, and the Wealthy.

THE BUSINESS SIDE OF CO-OPERATION.

F. C. HART, DIRECTOR OF CO-OPERATION AND MARKETS BRANCH, TORONTO.

The Fruit Growers of the Province are more largely organized, co-operatively, than any other branch of agriculture, one reason being that we have legal standards for apples, and as a result can sell the product according to that standard. As I look at co-operative associations over the province, I am impressed with the fact that the average member expects too much from his Association, and perhaps that is true of fruit associations as well as others. There is a tendency on the part of some Associations to practise false economy. Certainly large economies can be brought about by organization; but there are certain costs of marketing goods which are practically the same under any system. Those who have had charge of the marketing of farm products under the old system have become experts in eliminating waste, and where an Association starts to market its goods it cannot expect to lessen the cost of certain processes more than they are at the present time. For instance, as a result of the lack of appreciation of the business aspect of advertising on the part of our co-operative associations, the Government has come to their assistance in this regard. A product, however, should bear its own cost of advertising. Advertising pays not only in fruit, but in all lines. Coming down to this meeting, I passed on the street a little piece of crumpled, dirty paper that had some red printing on it. I could see one little corner of this paper, and from the marks on it I recognized the wrapper of the Sun-kist Orange. I believe any man in this audience who saw just a small part of the red print on that wrapper would have recognized it as the wrapper of an orange that was grown more than 3,000 miles away. The business aspect of advertising should not be lost sight of by members of this association.

Another point that is not appreciated is that capital is necessary in any business. One of the greatest difficulties in connection with the co-operative associations is lack of capital. A great many people are willing to join an association, but they are unwilling to take the business risk. They are willing that the other man should put his money into the business and take that risk. One of the principles of a co-operative association is that each member should be required to finance his part of the business. That is what co-operation means,

and in order to insure loyalty to the association each member must be responsible financially to the association, and he must be required to put up the capital to run the business.

We must not forget the fact that under any system of marketing the goods pay for capitalization. Even the itinerant buyer pays you cash, and he has to have capital to do it. He pays you in proportion, and naturally he gets more than interest on his money. If you are going into a co-operative association, you must recognize that the business has to be capitalized.

Different methods are used for raising capital: First, the joint and several notes of the members or directors; this is quite sufficient where a small amount of capital is necessary. The regulations and by-laws spread the liability of the joint and several notes equally among the members. A more common method of raising capital is by selling shares, the dividends on which are limited to a certain maximum percentage. This is, perhaps, the most satisfactory method where a large association is being formed and where capital is to be used in permanent equipment. A third method is by means of individual notes of the members used as collateral for raising money at the bank or from other lenders. By this method the member's cash is not used as capital but his credit is. It has the advantage that interest is paid on capital only while it is in actual use. If you want to use at a certain period of the year \$200 or \$300, you take these notes to the bank and use them as collateral to borrow the amount of money which you desire to use and you only pay interest on that amount of money. Under the share system, if you have taken \$2,000 cash from your members for shares, you should pay interest on the whole \$2,000, and part of that money may be lying in the bank at 3 per cent. interest.

The advantage of having adequate capital should be more largely recognized by the average member because the business is certainly hampered if sufficient capital is not in the hands of the manager. Under any system of selling goods, we like to be paid for the goods when they are delivered, and when we sell goods to a store or a buyer he pays us cash when we deliver the goods. An association should do the same, but in order to do that it must have cash capital. Some associations are buying supplies, and in some cases money can be saved by buying more than are actually required, and holding the goods over for another year, but in order to do that capital is necessary. Again, an association might want to build its own fruit-houses and this requires capital. I understand that there are a large number of fruit-houses in the Province, and practically none of them belong to the fruit associations properly. When a fruit-house has been established in connection with the Fruit Growers' Association, it belongs to a joint stock company, which is usually made up of some of the members of the Fruit Growers' Association. Now, it appears to me that if a Fruit Growers' Association is not strong enough financially to own a building, or a little piece of property, co-operation will not go very far, and these associations would be much better off from a business standpoint if they had sufficient capital with which to do things of this nature. If an undertaking is too risky or promises to be an unprofitable one, it should not be entered into under any consideration, but if it is good business, I can see no reason why the members should not be willing to put their capital into it. In the case of a fruit-house the objection is sometimes made that, as the fruit pays certain charges and these charges are used to pay for the fruit-house, and a member might be in an association for years and eventually own \$200 or \$300 in value for that fruit-

house. If he removes to another district, what is going to happen to his \$200 or \$300? That is overcome by having a reserve account into which all members pay in equal proportions. It is simply a matter of book-keeping to know how much of each member's money is in the reserve fund, and when he withdraws he can be repaid his part of such fund. This question of reserve fund is extremely important from a business standpoint. It would seem almost necessary to require associations to maintain a sufficient reserve fund. It is a business principle that is extremely sound, and every business should safeguard itself against difficulties. Many associations have gone to pieces just on that rock. Some little accident happens whereby things went wrong, and the whole association failed because they had not something laid by for just such a contingency.

Another important point that I desire to mention is in regard to the management of an association. There must be a business man in control. It is not necessary that he be an efficient producer, but he is required to sell the goods, and he should know something of the market and transportation problems, and all the details with regard to marketing. But, no matter how efficient a manager is, and no matter how much he is trusted by the association, the association should never be allowed to become a one man proposition. The directors should be in close touch with everything the manager is doing, and the members also should know what is taking place in the association; not for the reason that the manager may be considered unsafe, but simply for the reason that the members should be kept interested in the success of their association, and should have certain responsibilities placed upon them, so that they will give it their financial and moral support at all times. For that reason I do not think a manager should have complete control to the exclusion of the directors. An efficient manager will sometimes make a greater success of an association when he is not interfered with by the directors, but such an association is not in a strong position to carry on the business when the manager must eventually drop out.

The question was brought out strongly this afternoon of the importance of increasing the quality of the goods placed on the market. That is a sound business principle. Give your customers just a little better than they expect to get. It is certainly not business to endeavor to just come up to the standard. The endeavor should be to exceed the standard as much as possible.

One point in which most associations are extremely lacking is in the matter of keeping books and accounts. Books are not properly kept and accounts are not promptly rendered and collections promptly made. The annual statements sometimes reveals very little to the members as to the real financial conditions of the association. Every business, no matter how small it is, pays money for book-keeping. The book-keeping must be attended to. I think it is too much for associations to expect the manager during the busy season to sit up half the night keeping books and sending out accounts and expect him to do good business for the association during the day. Among some of the legitimate expenses to be incurred by any association is for the proper keeping of books. I have known associations to be completely put out of business simply because the manager did not keep proper accounts. One association has been defunct for three or four years, and there are still outstanding accounts in connection with it. The auditing of books should be carefully attended to. I would like to have an expert accountant in my department who could visit associations and audit their books, with the view not only to see that the vouchers all agree with the books, but to size up the business,

methods of the association, and to find their weak points and improper methods of doing business, and point out to them where these matters can be improved. I think a great deal of good could be done by such a man, who could visit associations and straighten out their business methods. I am under the impression that a good many associations would welcome an outside auditor. Some directors do not like to question the honesty of their manager, but perhaps there is a little doubt as to the real condition of things, and an outside man coming in might restore confidence.

MR. LORNE CAREY: I understand that one of the rules of co-operative associations provides for the auditing of the books.

MR. HART: That is simply to see that the accounts are straight. What I want is a man who will size up your business just a little differently and point out your weak methods of doing business.

MR. PATTERSON: Would not there be friction between the auditor and the manager?

MR. HART: Not if he is a proper man. Some things are going on in associations that should not be allowed. They are not stopped simply because nobody likes to interfere. I came across one association (not a fruit association, by the way) that had outstanding accounts of \$4,000. These accounts were long overdue, but the association was not charging interest on overdue accounts, and the merchants with whom they were dealing were letting these accounts run along. It is in matters such as this that an outside auditor could be of use.

I quite realize that I have not presented anything new or startling with regard to co-operative management of associations, but I have tried to point out some of the things that should not be lost sight of by co-operative associations.

EXPERIMENTAL RESULTS ON PEACH CANCER.

W. A. McCUBBIN, M.A., DOMINION FIELD LABORATORY OF PLANT PATHOLOGY,
ST. CATHARINES.

I bring this subject before you with some reserve, because with the limited time at my disposal this morning it will be impossible to give you all the evidence I have on this subject. The paper I shall give is somewhat sketchy in its nature, but I think it will be convincing as to the cause of the disease that is rather troublesome and causes more damage than most people are aware of. When I came to the neighborhood I noticed a great deal of the canker throughout the Niagara District, and those other peach growing districts, Lambton and Essex. In all cases it seems to have been very serious in its effect on certain parts of the tree, the large limbs and the trunk. The cause of the disease did not seem to be very evident at first, but by making an immense number of observations and a large number of experiments, I have been able to obtain what I think is a fairly accurate account of the cause of the disease, and I will give you an outline of the experiments this morning without going into minute details.

I assume that all peach growers are more or less familiar with the exudation of masses of gum from the peach tree, a phenomenon which is as natural to the

peach as the flow of blood from a wound in the human body, and which in like manner occurs when the tree is cut or injured in any way. I mention this in order to bring out the distinction between this general flow of gum from injuries and a disease which should properly be termed a canker. It is true that cankers are usually accompanied by a copious gum flow, but gum is also exuded from cuts, bruises, cracks, and borer holes, none of which are, rightly speaking, cankers. I shall, therefore, use the term canker in its more correct sense to apply to those unsightly open sores on the trunk and limbs of peach trees, which are due primarily to the death of the bark and the growing tissue beneath it, and which are extended from year to year by the dying of fresh zones of tissue at the edges.

Although this disease cannot be considered as of so serious a nature as Yellows and Little Peach, it is still sufficiently important to warrant attention. The damage done by cankers each year in the peach districts of Ontario is far greater than is generally known. Not only is there a great destruction of individual limbs by them, but whole trees are often destroyed by cankers developing on the trunk or around the crotch, and it is quite common to see trees of which a half or a third has been lost by the formation of a canker on one of the main limbs near the trunk. While the disease is present everywhere in the peach regions of the Province, it seems to be much more severe in some orchards than in others, and it is usually found at its worst on poorly drained or wet land. Peaches on sandy hillsides, where both air and soil drainage are good, are relatively free from the disease.

In attempting to work out a treatment for canker it is of the first importance to obtain as clear a knowledge as possible of the factor or factors to which the disease is due, for with the cause definitely known the method of cure or prevention becomes a much simpler matter to deal with.

Before entering into the question of cause I should like to dismiss with a few words a popular misunderstanding regarding cankers. There is a tendency among less observant peach growers to attribute them to the work of borer larvae, which one often finds buried in the gum and dead bark, and which eat out the soft fresh tissue at the edges. But though these "grubs" are very frequently associated with cankers, and play a part in enlarging them, they have nothing to do with causing the canker in the first place. They are not found in all cankers by any means, and are usually absent entirely from the early stages of every canker; so that, despite a widespread belief to the contrary, we must endeavor to find the cause elsewhere.

Judging from the manner in which many other well-known cankers arise, one would be inclined at the beginning to suppose that peach cankers are the work of fungi. Cankers of a similar nature, but without gum of course, are to be met with in apple, oak, poplar, sumach, and numerous other wild and cultivated trees, and so many of these, like the Black Rot Canker of the apple, have been shown to be the work of some particular fungus that there is a strong probability that peach cankers are likewise caused by fungi as well. The experimental work that has already been done supports this view. Jehle, of New York, succeeded in producing cankers by inoculating peach limbs with the Brown Rot fungus. Mr. L. Caesar, and Mr. H. T. Gussow, the Dominion Botanist, did similar experiments with Brown Rot, but found that though gum was copiously produced the wounds healed afterward without an extension of the canker. In the New York Report for 1900 there is a record of the inoculation of peach limbs with another fungus found universally on the dead and dying limbs of peaches, and gum exudations resulted in each case. In addition to these the writer has made numerous observations which tend to show that the cankers are caused by fungi. While in a few instances cankers may arise

from wounds, borer holes, frost cracks, and gum blisters, the vast majority start around the bases of dead twigs. Sometimes these twigs are seen to have been killed by Brown Rot, and many instances occur where a mummied peach remains on the tree, and at the base of its dead spur or stalk a canker has begun.

In numberless other cases there was no evidence of the Brown Rot, but the dead twig sticking out of the canker was covered with the minute pustules of the common *Cytospora*, previously mentioned. Even in the exceptions mentioned, where borer holes, cuts, etc., give rise to cankers, there is strong evidence that this last mentioned fungus has invaded the tissues about these places and has caused the cankers. The results of these observations were not conclusive, but served to strengthen the suspicion that either the Brown Rot or the *Cytospora*, or both, were closely associated with canker formation.

In order to add the weight of experimental evidence to these observations work has been carried on during the last two years by the writer with the object of finding out by the culture method what fungi were present in active cankers, and to determine by inoculation whether any of these were capable of forming cankers in healthy limbs. The account of this work is too long to be given here, but will be published later in bulletin form. Briefly, of the half dozen fungi obtained from cankers only one occurred with any frequency, and it was apparently the *Cytospora*, already mentioned. This was then inoculated into peach limbs. At the same time two or three of the other cultures were also used for inoculation as well as the Brown Rot fungus obtained from rotting peaches.

As was expected, only the two, the Brown Rot and the *Cytospora*, showed a clear and unmistakeable power to induce canker conditions in the limbs, i.e., they killed the tissue about the point of inoculation, set up a copious gum flow, and stimulated a pronounced callus growth around the wound.

It would seem, then, that the cause of canker is fairly well established to be due to either, or both, of the two fungi mentioned. It still remains to account for the enlargement or extension of the canker from year to year. There is a good deal of evidence which goes to show that while a canker may be started by one of these fungi, neither is likely to extend it after the first year unless the surrounding tissue is first weakened in some way. And the only reasonable explanation which will account for such weakening is that the callus around the incipient canker is stimulated by the presence or by the action of the fungus into late and abnormal growth, and hence entering the winter in an unripened condition is killed by winter cold. The fungus is then able to invade the injured area, and the canker spreads. The mass of evidence which can be brought forward to support this view is very large, and will have to be given in detail elsewhere, but I think there can be no doubt whatever that the freezing of the immature callus is a very important factor in the enlargement of cankers on the peach.

In order to prove beyond question the possibility of this process of canker formation, I froze some three or four cankers in late summer (Sept. 17) with artificial cold, using a cylinder of carbon dioxide for the purpose. In each case the tissue was destroyed, and a callus has since formed at the edge of the dead area.

According to the evidence in hand at present, the process of canker formation may be summed up as follows:

A fungus (either Brown Rot or *Cytospora*) establishes itself in a dead or dying twig, a wound, crack, or borer hole, and kills a small area of the living tissue. There is a stimulation of the healthy tissue around this area which results in the formation of an excessive callus growth. This callus enters the winter in an unripened

condition, and is killed by freezing. In the following spring the frozen area is invaded by the fungus, and the process is repeated.

It is possible that with further study some slight modification may have to be made in this conception of the origin and spread of Peach Canker, but at present it seems to fit without any disagreement all the facts known to me.

The problems of prevention and cure can now be intelligently discussed. I am unable to state definitely what proportion of our cankers is due to each of the fungi mentioned, but I think I am safe in saying that by far the greatest number arise from twigs killed by *Cytospora*. In dealing with this fungus, as well as with Brown Rot, it must be remembered that though the spring spray will destroy all surface spores, it will, unfortunately, not reach the fungus in its habitat under the dead bark. It remains here unhurt, and forms countless spores in the minute pimply pustules which may be seen on almost any dead peach limb. It is necessary then in clearing an orchard of this fungus, to get rid of all dead twigs and branches as soon as possible. In the same way no Brown Rot or mummied peaches should be allowed to remain on the branches. A little extra care will be needed at pruning time to effect this result.

In the light of what has already been said regarding the cause of canker the treatment of cankers already formed can be outlined with some confidence.

It would be absurd, of course, to try to treat cankers on the smaller limbs, but where a canker involves the trunk or main limbs it is well worth while to get it to heal up. The main object is to put the canker into such a shape that the callus around it will grow sufficiently hard and mature to resist the winter. The best way to do this is to clean out all the gum, dead wood, and bark to allow access of the sun and air, and to keep it as dry as possible. After a rain is good time to do this, as the gum is then soft, and it should be done early enough in summer, so that the wood will ripen before fall. After cleaning it is well to wash or brush out the canker with an antiseptic solution (Corrosive sublimate, 1—1,000), and when dry to give it a coat of ordinary lead paint. The corrosive sublimate destroys all fungi in and about the canker, and the paint prevents them from invading and rotting the dead heart wood afterwards.

This treatment costs for labor and material about five cents per canker, and has given excellent results in the experimental work carried on during the last three years by the writer, as well as in actual practice by some of the Niagara peach growers themselves.

DR. JESSOP: Did you find the canker more prevalent on young than on old trees?

MR. McCUBBIN: It apparently does not attack the trees until two or three years old. It is worse on trees that are weak or unhealthy.

MR. FLEMING: Did you observe that an excessively healthy tree showed more signs of canker? I do not think we have any remedy for canker yet. I think canker can be checked by thoroughly cleaning out the canker and painting the limbs. Dr. Jessop mentioned young trees. I recently bought a young orchard and found a considerable amount of peach canker, and I attributed it to careless pruning. I found the branches had been cut off leaving an inch or an inch and a half, and there was where the canker started.

MR. McCUBBIN: Rapidly growing, vigorous trees would be liable to canker because they would not ripen in the fall. Of course there is no orchard in which the fungus is absent.

MR. FLEMING: How does the fungus get there?

MR. McCUBBIN: In any orchard you will find trees that have died of natural causes. A number of twigs die each year, and these trees are affected by the fungus.

MR. FLEMING: How do you account for canker caused by a bruise?

MR. McCUBBIN: The bruise might cause a late growth of tissue which would be killed in the winter and the fungus might get in. The largest number of cankers I have seen were caused from dead twigs.

PRECOOLING OF CANADIAN FRUITS.

EDWIN SMITH, IN CHARGE FRUIT COLD STORAGE AND TRANSPORTATION
INVESTIGATIONS, GRIMSBY.

The precooling of fruit for shipment is commonly supposed to be a practice of recent origin. Pioneers are not often heard about, and this is true with the people who started the work of cooling fruit before shipment. The first man to develop precooling as a special process in the fruit shipping industry was Mr. Parker Earle, of Cobden, Ill. Like all pioneers he met with a great deal of grief in developing new methods for tender fruit shipments. After repeated losses in the latter sixties in attempts to ship strawberries to Chicago and Detroit in the then crude types of refrigerator cars, he constructed a cooling house in his packing shed. By leaving his berries in this house for 24 hours to cool off, then sending them to Chicago by express, he found that they arrived in much better shape than those which were sent as soon as picked. He then went to Chicago and secured what was then the best refrigerator car that had been made, the old Tiffany car, built to carry dairy products. After cooling the berries in the cooling house they were placed in the car and sent to Chicago. The venture was a complete success from the start, and resulted in placing on the Chicago market more solid and better-keeping berries than had ever before been seen there.

The date of this first successful shipment was 1872. It is certain that rapid development in the refrigeration of fruits for transportation proceeded from this date, but not until after G. Harold Powell, of the United States Department of Agriculture, started his notable investigations into the transportation of fruits and employed precooling for the shipment of Georgia peaches to New York, in 1904, did we commonly hear of the now much used term "precooling."

The results of Powell's experimental trials and demonstration in California were so effectively brought to the attention of the railroads and shipping organizations, that not only did they start the erection of large precooling plants but they also took steps to remedy their handling methods, so that the possibilities of successful orange shipments to far-off markets mounted to undreamed of heights and popularized the expression "precooling," so that it has ever since received widespread attention. Since then precooling has been applied to the shipment of practically all tender fruits from various districts in North America.

DEVELOPMENT IN CANADA: The need of improving transportation facilities has been felt in various fruit districts in Canada for a long time. Excessive losses in shipping tender fruits from Ontario to the Western and Maritime Provinces; losses in exportation of fall apples and pears from Nova Scotia; losses in prairie shipments of small fruits from the Lower Fraser Valley and peaches from

the Okanagan Valley, British Columbia, have all called for discussion, investigation, and remedy, in which the word "precooling" has been heard more or less frequently. This has led to early attempts at cooling fruits at Grimsby, Ontario, with various trial shipments to the West. The establishment of the St. Catharines Cold Storage and Forwarding Co. took place and started western shipments. In 1912 the government of British Columbia appropriated funds to carry on precooling investigations, and in 1913 installed a precooling plant having a capacity of two cars per day in the warehouse of the Summerland Fruit Union.

Owing to a failure of plans of fruit growers in the Niagara Peninsula whereby a large central precooling plant for the district was being promoted, active attention of the Dominion Government was called into this field, and by the latter part of 1913 the erection of an experimental cold storage for precooling was started at Grimsby, Ontario, under the direction of Mr. J. A. Ruddick, Dairy and Cold Storage Commissioner. This plant was completed previous to and initiated during the fruit season of 1914.

TYPES OF PRECOOLING PLANTS: There are two general types of precooling plants using distinctive systems, viz., car precooling and warehouse precooling. With the former a blast of cold air is blown through a loaded refrigerator car for several hours previous to shipment, while with the latter, or warehouse type, the fruit is placed in a cold storage room, cooled down to from 38 to 40 degrees Fahr., and then loaded in an iced car in a cold condition.

With either type of precooling plant one of two general sources of refrigeration may be used—ice or mechanical refrigeration. The modern method of using ice is with the Gravity Brine System, in which the temperature of the brine is cooled to from 0 to 10 degrees Fahr. by rapidly melting ice with salt about the primary coils in an insulated tank. The primary coils being connected with the secondary coils in the cold storage or in "the coil-room-bunker," a circulation of cold brine is immediately set up as soon as the brine in the upper or primary coils becomes more dense from becoming cold. The process of mechanical refrigeration is based upon the condensing of a vapor (ammonia, carbon dioxide or sulphur dioxide) to a liquid by the use of pressure and cold water, and then evaporating the liquid in coils placed in the cold storage or in the "coil-room-bunker." The term mechanical is derived from the mechanical compressor used to place the vapor under great pressure.

In designing the Grimsby plant the type selected was of the warehouse design using ice as a refrigerating medium in a Cooper Gravity Brine System. The warehouse type was selected for the following reasons: (1) The car precooling plant is not economical since a large part of the refrigeration is lost through connections with the car, leaky car doors, vents and insufficient insulation in refrigerator cars. The warehouse plant is well insulated and self-contained, with a minimum loss of refrigeration through transmission. (2) The car precooling plant is not efficient because faulty connections and misdirected air currents that are unavoidable in cooling a loaded car, result in cooling unevenly throughout the car. In a warehouse the cold air is evenly distributed through perforations in a false floor and false ceiling so that all fruit is cooled evenly and thoroughly to from 38 to 40 degrees, with no possibility of freezing fruit in one part of the room and having it at a temperature of from 45 to 50 degrees in another. (3) The car precooling plant causes delay between picking and cooling as the car has to be loaded and shipped to the precooling plant before the cooling can be started. A few hours in the heat before precooling means the shortening of the life of the

fruit several days. If too much haste is used to overcome this the fruit is roughly handled and the car poorly loaded which will more than undo the benefit of pre-cooling. With the warehouse type the fruit is cooled as soon as packed and loaded while cold. Capable experts who load cars day after day at a precooling warehouse insure careful and secure loading. (4) The car precooling plant is not wholly adaptable to the cooling of deciduous fruits. To cool a car in four hours it is necessary to have the blast of cold air near 10 degrees. Peaches, plums and tomatoes will soon freeze at this temperature. If a longer time than 4 hours is taken the capacity of the plant is cut down and congestion follows. (5) A warehouse plant offers the opportunity of assembling cars of fruit during the dull season, making shipments of tender fruits possible that would be impossible with the car precooling plant. (6) The warehouse precooling plant is used as an apple and general cold storage after the precooling season. This greatly lessens the heavy overhead expense of a plant which would otherwise be used but a few weeks during the summer.

With our present arrangement fruit is brought in from the orchards as soon as picked and packed, loaded from the drays to specially designed trucks which are then run into one of the four precooling rooms. Each room holds considerably over a carload of boxes or baskets loaded on trucks, and has a perforated floor and ceiling through which a circulation of cold air is blown from the coil room by means of large 60 inch fans. Electric thermometers are placed in the bottom and top tiers of fruit packages, and as soon as the fruit is entered the doors are closed, the fans set in motion and cooling is started. By means of the electric thermometers the temperature of the fruit is taken from the outside and as soon as sufficiently cooled for shipment (38 to 40 degrees) loading takes place.

Fruit once cooled down *must not be exposed to the warm air* until it reaches the market, consequently a cold corridor extends from the precooling rooms with an adjustable vestibule to the refrigerator car door. Through this the trucks of cold fruit are run directly into the cold car, thus preventing exposure, rough and unnecessary handling of packages and greatly cutting down the work and time necessary for loading.

RESULTS OF THE PAST SEASON: Although handicapped by not having a peach crop to handle, the season of 1914 has been an active one at the Grimsby plant. The first experimental shipment was made by the Dominion Department of Agriculture on July 16th, when 2,277 baskets of Montmorency cherries were pre-cooled and shipped to Winnipeg, arriving there in splendid condition on July 22nd. The fruit was sold on commission by the Scott Fruit Company for 60c. per basket. At the same time other sour cherries were selling in Winnipeg markets for from 38c. to 42c. This speaks for the superior quality of the pre-cooled fruit.

From this time on the growers and shippers took advantage of the plant and 35 cars of cherries, plums, pears, tomatoes and other fruits have been pre-cooled and shipped west at freight rates.

As a cold storage plant great savings to the growers have been made during the whole season. In one case during the raspberry season when the canning factories were unable to receive berries that had to be handled at once as much as four and one-half cars of fruit were brought to the plant, placed in a low temperature for two or three days till the factories were again in shape, and thus avoided a certain loss of over \$3,000. In another instance a shipper who was exporting Bartlett pears to Glasgow was unable to get his refrigerator space on ship owing to the requirements of war shipments. The pears were held for three weeks in perfect condition and the shipment made on a later boat.

An interesting experiment was tried in handling Red Astrachan apples. These apples usually go out at a fairly low price, but between their season and that of the Duchess there is a scarcity of early apples. This shipper placed his apples in cold storage prior to August 15th, then marketed them as they were demanded by the trade during the latter part of the month, making a neat gain on the transaction. Similar trials were successfully made with tomatoes, and with the shipping of ripe tomatoes.

SCIENTIFIC EXPERIMENTS: In addition to the commercial use of the plant the experimental cold storage laboratory that occupies a portion of the building has been used for scientific investigations connected with the cold storage and precooling of tender fruits.

In this laboratory we have three different constant temperatures, and here we are making records on the behavior of all our tender fruits.

The scientific part of our Grimsby work is of great value to the grower. To illustrate this I will cite our work with tomatoes. We are running tests on the Earliana, Chalk's Jewel and Danish Export, picked at three different stages of ripeness, stored at 32 degrees, 39 degrees, and 45 degrees. These are stored in eight different kinds of packages.

We have found that the Earliana and Chalk's Jewel are of little use for cold storage. The first variety will store in fair condition for three weeks, while the latter but little over a month. It is useless to try to store a tomato that is cracked or injured in any way. The most of our varieties in Ontario are too subject to cracking about the stem end. A small sized tomato stores better than a large one. For storage the tomato needs to be picked when turned to straw color, earlier than this it will not color before it softens upon removal, and if picked riper it will soon become soft in storage. We have found that tomatoes wrapped and stored in the four-basket plum crate of British Columbia keep better than when stored in open baskets. Placing tomatoes in wood wool proved better than wrapping, while storing in a box having a sawdust filler kept the tomatoes in the best shape, especially where they were cracked. The value of this work is to be seen at once when I cite a grower who came to us and wanted to cold store a carload of tomatoes till Christmas time and get the big prices paid for hot house tomatoes. Our records at the time did not encourage him, and I talked him out of it. He would have lost the entire car had he stored the varieties of tomatoes grown.

PRE-REQUISITES OF PRECOOLING: It must be understood that to precool fruit it is not always necessary to have an elaborate and expensive plant. Anything that lowers the temperature of the fruit previous to shipment tends to check its ripening processes and postpones decay. At Summerland, B.C., a type of plant is being experimented with that costs from \$1,500 to \$3,000, and is giving splendid results. At Mission and Hatzig, B.C., the Provincial Department of Agriculture has carried on experiments to show the beneficial results of using the cold night air that they have in that region, and also by picking raspberries in the early morning while the dew is yet present and removing the moisture by fanning in a dehydrator before shipping. Such an appliance costs but from \$25 to \$50 depending on the size, and so successful has it been that the growers have become enthusiastic about it and are picking in the rain and making very successful shipments after dehydrating. The practice of wet picking is not to be encouraged in regions where plenty of dry weather is to be had. Mr. J. O. Wiggen, of Wyndale, B.C., cools his strawberries by placing them in a cooling house situated in a

mountain "draw" or ravine, through which currents of cold air pass during the night. This practice coupled with his admirable cultural and harvesting methods gives him a wonderful reputation in all his markets, and he thus commands high prices.

In precooling fruit for express shipments extreme care must be used not to overdo the work. While in British Columbia I had charge of a series of investigations in the Lower Mainland precooling strawberries for express shipments. By means of thermographs I secured the average temperature of the express cars travelling between that region and the prairie markets. Berries were then cooled to various temperatures from 45 degrees up till they were shipped at the same temperature as taken from the patch. On the market an inspector determined the score of the fruit and percentage overripe. The results showed that cooling was beneficial to the average cooled five degrees below the temperature of the express cars. When cooled lower than this the berries suffered on account of the condensation of moisture on removal from the cooling chamber, with a resultant growth of mold which was as bad or worse than when shipped hot from the patch.

But whatever method of precooling is used successful shipments are impossible if other points in handling are neglected. Precooling is not a panacea and will not make over-ripe or injured fruit arrive in good condition. This was admirably illustrated during the past season when two cars of fruit were shipped the same day to the same firm in a prairie city. One car was delayed and arrived twenty-four hours later than the other. The delayed car was in ideal shipping condition, with fruit at an even and satisfactory degree of ripeness and arrived at its destination in perfect condition. The car that was not delayed contained plums that were beginning to soften at the time of shipping and some carelessly packed, and arrived at its destination with a part of its plums in bad shape.

To have precooling work to the advantage of the shipper the following precautions must be followed: (1) Frequent pickings of fruit to avoid ripeness and secure even maturity; (2) careful handling in picking, packing and hauling; (3) careful grading and expert packing; (4) immediate cooling after picking and packing; (5) immediate shipment after cooling; (6) secure and careful loading in satisfactory iced refrigerator cars.

At the Grimsby cold storage we can only control these pre-requisites by refusing to receive fruit that is not in good condition, and even this means cannot be as effective and as satisfactory as where the shipper or grower is honest enough to serve his own interests best by shipping only satisfactory fruit promptly and carefully harvested.

By controlling the loading of the cars we are able to govern this factor for successful shipments. On all long distance shipments the fruit is raised 4 inches from the refrigerator car floor on a slatted rack and loaded so as to leave a continuous air space. In the center of the car a space is left from two to five feet for air circulation and the loads in either end of the car are held rigidly in place by bulkheads and proper braces. This is the most effective way of stopping the evil of broken packages, and by using care we have not had a complaint about a single broken package during the season.

Precooling is yet in its infancy in Canada. When fruit is properly picked and carefully handled without delay the advantage of precooling has been shown beyond all doubt. As yet we have made only a start, and to look forward to the day when each shipping point will have its precooling plant is a long step, just as it is to

look ahead to the time when our fruit will be carefully and honestly packed suitable for precooling and long distance shipments. But I am convinced that the time when these desires will be realized is not many years away.

MR. SMITH: How long have you been operating that plant?

MR. EDWIN SMITH: Not quite a year.

MR. BUNTING: How long did you have Bartlett pears stored?

MR. EDWIN SMITH: I have some Bartlett pears stored there now. I would not advise holding Bartlett pears more than a month, but I think it is perfectly satisfactory to hold then a month or six weeks.

THE VINELAND EXPERIMENT STATION: ITS PURPOSE, AIMS AND METHODS.

F. M. CLEMENT, DIRECTOR.

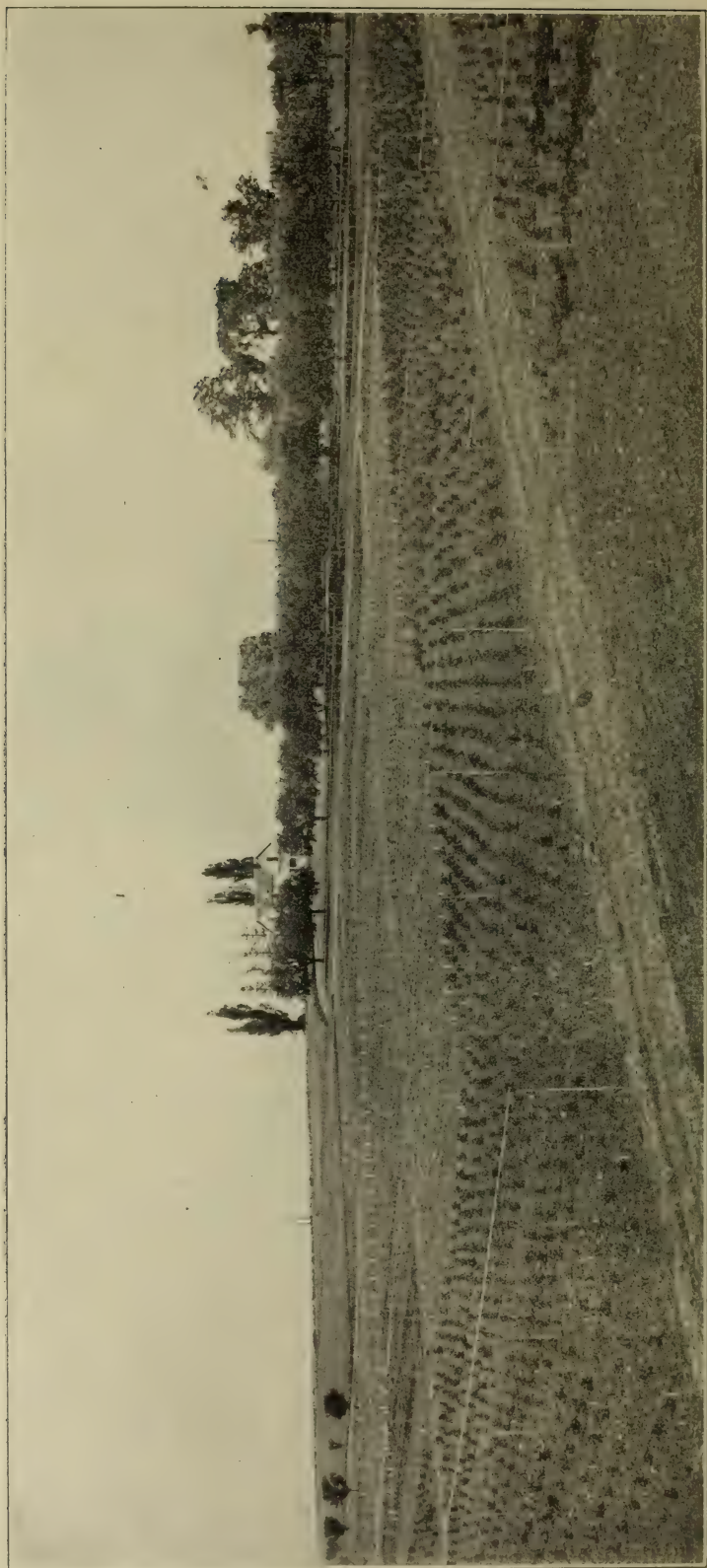
The Vineland Experiment Station is what its name implies and suggests—a farm set aside for experimental and investigation work along horticultural lines. Situated at Vineland, in the heart of the leading tender fruit section of Ontario, it is naturally adapted to the study of problems related to tender fruits, but not entirely. All fruits are represented, and as time goes on the scope will undoubtedly broaden.

Apples are the leading fruit in the Province, and it can hardly be expected that the Provincial Station should not give them the place they deserve. Progress at the best is slow. I am sometimes asked what good an experiment station can do; of what value it is likely to prove to the fruit growers of this Province, and has anything been accomplished. In answer to these questions, I shall take a few minutes to dwell on experimental work in general and then to make applications to our particular case.

The work may be divided into two parts: (1) A study of varieties, cultural methods and such problems as are faced ordinarily by the fruit grower; (2) the production of new varieties and a study of the laws and principles underlying the various operations of orchard practice. The former is experiment, testing underlying conditions side by side, varieties, cultural methods, spray mixtures, etc., with the hope of throwing some light on the various practical operations of everyday orcharding. The latter is the true investigation and is of most value.

Principles and laws are the same throughout the Province, and when once a law is established and understood it is of infinitely more value than isolated fact, no matter how clearly the fact may have been demonstrated.

The work as thus outlined is not as it appears to the ordinary observer. To him the station is devoted to the growing of fruits and vegetables and to plant breeding. That is correct, but the main objects are experiment, investigation and research as just outlined. More than 140 varieties of peaches in the variety test section looks like an interesting and instructive experiment, but yet not nearly so interesting as more than 1,040 seedlings of Early Crawford parentage at present showing various degrees of hardiness or thrift. No two are alike. In some, the growth is vigorous and the trees give fair promise of being equal to or better than their parents. In others, the growth is weak and being claimed by disease. More than 54 varieties of grapes make a nice collection



Tomatoes, Strawberries, Raspberries and Garden Crops under Irrigation at the Experimental Station, Vineland.

and a very attractive exhibit when neatly arranged, but they are not nearly so instructive or interesting as 5,000 seedlings of known parentage growing in the nursery plots. The same might be said of strawberries. The 92 varieties yield a fund of information but not nearly so much as the 7,500 individuals growing in hills near them. The point I wish to make clear is this: our aim is not only a study of old varieties and old methods, but the principles underlying the production of newer and better varieties, and underlying methods of production now commonly in practice. It might be argued that you cannot hope to do this. Experiment stations have not produced even one of our leading varieties. Let us take the apple as the example. Northern Spy, King, Baldwin, Greening, McIntosh and Fameuse, where did we get them and how long were they known before they were introduced to the trade? The Northern Spy was planted as a seedling in Bloomfield, N.J., in the year 1800. It did not attract attention outside of its locality for forty years, and was not listed as a popular variety until 1852, fifty-two years after the seedling was planted. The King was found growing as a seedling about 1804 at Washington, N.J., and was not generally known until 1857, when it was listed by the American Pomological Society. The Baldwin, the most largely grown winter apple in the Northern States and Canada to-day, came up as a chance seedling some time after 1740. For forty years it was not known outside of its own locality. No mention is made of it in the work of Coxe on fruits in 1817 and in 1832, almost 100 years after the seed was planted, it is just given brief mention in Thacker's *American Orchardist*. By 1852, it was recognized as a popular apple and has gained in popularity ever since. The Rhode Island Greening was supposed to have been planted in 1748, a seedling, but only after 100 years was it spread far from its native state. McIntosh and Fameuse are both of shorter history, and though to-day very popular are not found planted in large blocks except in a few cases in certain localities. The box package is making them popular, and in years to come we may expect to see them planted more heavily.

Cross breeding was first taken up by an experiment station in Canada in 1894, just twenty years ago, the work being done by Prof. Macoun, at Ottawa. To-day we have 23 promising seedlings from Prof. Macoun's selections growing in our variety test block at Vineland, and a great many more, especially all the hardier types, are being tested on the branch farms through Canada. Fairly good progress in two decades. Time goes slowly, and it takes oftentimes a century for a variety to establish itself. What some of Prof. Macoun's seedlings may be to Canada, and particularly the Canadian West, a hundred years hence, it is difficult to say; but I feel quite certain they will have at least won a place. Peaches, grapes, raspberries and strawberries require a short period to fruit, but even with these the time required to hybridize, to grow in the nursery, to grow in the commercial plots, and then to test locally, is measured by tens of years, not years. Prof. Zavitz spent more than twenty years on his experimental plots before he produced O.A.C. No. 21 Barley and O.A.C. No. 72 Oats. These plants are annuals. What can we expect from plants that require at least two years to fruit? I do not give all this as an excuse for the failure of the station to produce anything of commercial value in the eight years of its existence, because our efforts are very promising, but to emphasize the point that it requires many years, not a few years, to get results.

When we are living the years and waiting results, time is long; but when we consider the progress along horticultural lines in 250 years, the results are

astonishing. In published works about the year 1650 and 1660 we find these statements: "To get an inscription on the fruit, inscribe the words on the stone of the peach or almond and the inscription will often appear on the ripe fruit of the tree." "To have all fruits taste as you shall think good, let the stones soak in such liquor as you would have them taste of." "To make white lilies become red, fill a hole in lily root with some red color," and one other remark that is not so ridiculous—speaking of potatoes—"they will make very good bread, cakes, paste and pies, and increase of themselves in a very plentiful manner with very little labor. They will likewise grow and thrive very well being cut in slices and then put in the earth." In the years following many of the apparently ridiculous statements have been corrected. We are to-day correcting some errors of former generations, and I doubt not but that the succeeding generations will smile at some of our methods, and refer to them as coming from the dark ages just as we smile at the methods of two and three hundred years ago. We are aiming at the truth. We are conducting experiments in spraying, using the various common and uncommon insecticides and fungicides. We are conducting cultivation experiments using the greatest extremes from clean cultivation to sod mulch. We have experiments with fertilizers on peaches and strawberries, and irrigation tests on strawberries, raspberries, tomatoes and asparagus. The details in each case are being carefully carried out.

An experiment conducted this year in the thinning of apples is of special interest, and I give it as an example. Forty-six trees in our old orchard are admirably adapted to such an experiment. The varieties are largely Baldwins and Greenings, and this year as a whole they were heavily loaded. Twenty-six of the trees were selected at regular intervals and thinned, care being taken to leave the fruit well scattered over the tree and in as perfect balance as possible. An average of 3,191 apples were removed from each tree. We aimed to leave only one apple to a spur and often not that if there was any likelihood of the fruits touching each other when they had attained full size. The work was done from the 8th to the 16th of July, when the fruit was about the size of shelled walnuts and smaller. Thinning shears purchased at a cost of 31c. a pair, were used to cut the stems rather than pulling off by hand; $5\frac{3}{4}$ days for two men or $11\frac{1}{2}$ days for one man were required to do the work at a cost of \$1.75 per day. This is an average cost of 77.4 cents per tree. One-fourth of this time was used in picking up the apples and counting, which is equal to 19.3 cents per tree, leaving 58.1 as net cost per tree, when the trees were thinned commercially. The 26 thinned trees yielded a total of 48.7 barrels of firsts, including fancy, 15.1 barrels of seconds and 20.6 of culls. The culls included all the windfalls. This gives an average of 2.46 barrels per tree, which are worth \$1.90 f.o.b. or \$4.66 per tree f.o.b. The 20 unthinned trees yielded 25.4 firsts, 23.6 seconds and 23.7 culls including windfalls. This again is an average of 2.46 barrels per tree. At \$1.90, the return per tree is exactly the same for thinned as unthinned. The firsts sold the seconds, but on an estimate of \$2.25 for the firsts and \$1.70 for seconds we have a return of \$5.20 for the thinned trees and \$4.86 for the unthinned trees, a gain of .34 cents per tree in favor of the thinned. A fairly accurate record of the time required to pick and pack the thinned trees gave again an average of six minutes per tree in favor of the thinned trees for four men or 24 minutes per tree for one man. This at \$1.75 per day is worth 7 cents, making in all a gain of 41 cents in favor of the thinned. The net cost of thinning was 58.1 cents per tree, or all told, making a cash loss of 17.1 cents per tree.

Three other factors we must consider. (1) A share of the firsts were fancy and might have been sold for more money if sold alone. (2) It is doubtful if it is good policy to put seconds on the market at all this year when there is an abundance of first and fancy. Their value is really less than I have given them. (3) The effect on the crop for another year. This latter factor cannot be answered now, but the experiment is laid out to extend for a period of years and will be reported on from time to time.

In conclusion I wish to state that besides working with plants, studying their lives, their ancestors and their offspring and their special requirements of soil, air and water—their nature and their nurture—we are in addition farming a farm. We are dealing with trees, soils and markets the same as you are. We differ from you, as far as our farming operations are concerned, only that we do not feel the stringency if our products do not sell well. We are willing to sacrifice a shipment or more in order to establish a fact. Also we have many varieties and you have comparatively few. Because of our practical experience we maintain we are able to assist you. We ask your co-operation. If you have a promising seedling or a mutation send it to us. We will propagate and test it for you as your property. It is our business to help and we only ask an opportunity to do so.

PROF. W. T. MACOUN: Was the proportion of codling moth and scab less in your orchard?

MR. CLEMENT: Yes, we had comparatively little scab or moth. We conducted a spraying experiment and a thinning experiment. We used two different brands of sulphur. I am not prepared to report definitely on that experiment.

MR. DAVIS: How much of a decrease was there in the total yield due to thinning?

MR. CLEMENT: There was not any difference at all. The removing of 55 per cent. made no difference. On the thinned trees we got a remarkably good color. The apples were more perfect and regular and uniform in color. These two factors stand out, uniformity in size and color.

SELECTION OF NURSERY STOCK.

PROF. J. W. CROW, O.A.C., GUELPH.

I first want to refer to the question of thinning. I have taken Mr. Clement's figures and I have figured as I did yesterday, 57 per cent. No. 1, 19 per cent. No. 2, 24 per cent. No. 3, and following these at yesterday's figures, \$1.25 on the tree for 1's, 75c. for No. 2 and 15c. for the culls, the apples would be worth \$89.10. The unthinned crop runs 35 per cent. No. 1, 32 per cent. No. 2 and 33 per cent. No. 3, giving a valuation on the same basis of \$72.70, or a difference in favor of thinning the apples of \$16.40 per 100 barrels. That means that a man can afford to spend \$16.40 in thinning his apples. Mr. Clement stated to you that the cost of thinning was 15c. a barrel.

MR. CLEMENT: It would run almost 20c. a barrel for No. 1.

PROF. CROW: Mr. Clement's work would be much more carefully done than straight commercial thinning. On the thinned trees, we had not more than 5 per cent. of culls.

MR. CLEMENT: We can practically eliminate the culls by thinning.



Thinning Apples when about the size of walnuts at the Experimental Farm, Vineland.

PROF. CROW: I submit in support of my argument of yesterday that a man can afford to spend \$16 on thinning his apples, and that it is certainly worth while to do so, because if a man thins his apples and only breaks even, he will be money ahead because he will have a crop of apples the next year.

MR. KYDD: If you thin the apples once, will you expect the trees to have a fairish crop the next year?

PROF. CROW: I do not know to what extent it is possible to get a crop of apples every year. In order to do that we have to properly fertilize and prune, but I expect that if we thin our apples and prevent over-bearing and properly care for the trees in other respects, we will get a crop of apples in an off-year. As proof of that, I would like to bring to your attention the experience of some of our peach-growers. Some of these men get a crop of peaches every year, barring frost.

MR. PATTERSON: In my experiments, I found that it was not true that you could get a crop each year by thinning. My theory is that to a certain extent apple trees form habits the same as people. If you take a young tree and never allow it to over-bear, there is a considerable expectation of getting an annual crop, but if you ever allow it to over-bear, that tree gets the habit of over-bearing.

PROF. MACOUN: We have been keeping records of the yield of the individual trees in our orchard at the Experimental Farm for the past 17 seasons. We have about 3,000 apple trees in this test. We have found that certain trees of certain varieties, like the Duchess and the Wealthy and the McIntosh, will bear a good crop every year. We have had a continuous crop of Duchess apples of from two to four barrels a tree, and we have had the McIntosh bearing continuously. But we have other trees that have practically no crop one year. If you keep your orchard in a good state of cultivation and fertilize it well, the thinning will not make quite as much difference in the amount of crop as one might expect. Anything that checks the growth of the tree in the early part of the season, June or July, will affect the crop for the next year. If you get a dry spell, when the fruit buds are forming in June or July, you will probably have a large crop of fruit the next year, therefore, if you have a heavy crop of fruit on your trees this year, it is likely to check the growth of the tree and throw it into fruit for the next year. Of course if the trees are starved, thinning will affect the crop the following year.

MR. ARMSTRONG: I had a discussion with a neighbor on this subject, and he told me he could get five baskets from a six year old peach tree, and I got ten. He got \$1 a basket, and I got 50c. He had as much money as I had, and I argue that my trees will not carry out the same condition later on. The same thing applies to the apple, it is the seed that takes the most nourishment out of the soil, and you have double the quantity of seed to produce in the unthinned tree.

MR. BUNTING: During the past few years, I have done more or less thinning of both peaches and apples, and I regret that I did not do more of it; the results have been very satisfactory. I have had consecutive crops of Greening, and my Kings are bearing annual crops.

PROF. J. W. CROW: We will now take up the discussion of the question of nursery stock. I have a number of views showing how nursery stock is grown and the various classes of stock which are offered for sale. Most of you are familiar with the production of nursery stock. The first illustration shows the first year's

growth in a nursery. If you want the right kind of sweet cherry trees, you should buy one year old stock. The custom has been for nurserymen to sell two year old trees, but I am convinced that the one year old tree is the best.

A MEMBER: What stock do you grow sweet cherry trees on?

PROF. CROW: I would want them on sweet cherry stock every time. It is what the nurseryman calls Mazzard stock. Some nurserymen will put sweet cherries on sour stock, and not tell you that there is a difference. Sour cherry stock is not satisfactory for sweet cherries, because it has a shorter life and the stock is not strong enough.

In some of the stronger growing varieties of plums, I am convinced the one year old tree is best. The good tree is the one that gets up to four or four and a half or five feet high the first year. Some of the Japanese plums will reach four and a half or higher the first year. The height of a tree is not a perfect index of its value; the diameter should count as well. What we want is a stocky, well-grown tree up to four feet.

MR. PATTERSON: Do you prefer two-year old apple trees?

PROF. CROW: I think we will get better satisfaction out of two-year old trees. The apple or pear tree does not grow as strong the first year or two as the plum or cherry or peach. One objection to the planting of one-year old whips in apples is that the ordinary workman does not think much of them and will drive the waggon or harrow over them. The fruit grower can do better work by using a one-year old whip than by taking a two-year old tree out of the nursery, but for a general planter, I would say take the two-year old tree.

A MEMBER: If you were planting out a whip, how many buds would you allow to start on it?

PROF. CROW: If I were planting a one-year whip in an apple and wanted to form a properly shaped tree, I would want to start as many buds as I could, so as to give as wide as possible space for branches when it came to eliminate some and leave scaffold branches. I want three scaffold branches, and in order to get three in the proper place, it is necessary to get as many buds started as you can. I have experimented on that point carefully, and have been able to take a whip and get a tree of proper form in one year. I can get two scaffold branches the first year in the right place and then I have to take the central leader to get the third scaffold branch where I want it.

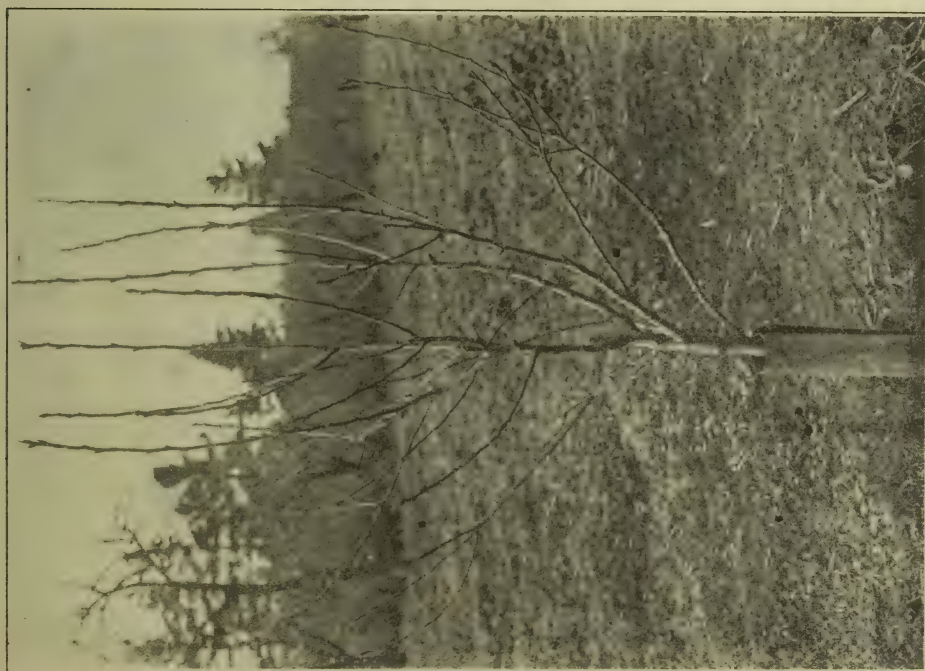
A MEMBER: Will you take that central leader out of that tree?

PROF. CROW: No, you have to leave part of it. The best plan of the head of an apple tree that I have been able to get is what you may call a modification of the vase form, that is where the central leader is carried up.

MR. PATTERSON: In setting out a two-year old tree would you trim it back to the whip or form a head?

PROF. CROW: Ordinarily as you get a two-year old tree from the nursery it has a well defined head and it would be out of the question to remove that head and take it back to the whip stage.

The next slide shows a number of trees pruned after the method of a gentleman in the audience. His method is to leave three main scaffold branches, and then to leave a lead up the centre of the tree. The idea is that the terminal bud of the central branch is the strongest bud on that tree, and that it is of some value of the tree to have that terminal bud there because it starts into early growth and strengthens the tree. I think the idea of the man who uses this system is to remove that central leader entirely after the tree becomes thoroughly established, say the second year.



A young Apple Tree before and after pruning.

PROF. MACOUN: We have adopted the idea at Ottawa of pruning our trees very little when we set them out. We have a small nursery of our own. I think there is an advantage in leaving at least one of the branches with the buds at the top. If you prune all the branches back one-half it may be three weeks or so before the buds break, and that three weeks may be one of the driest times of the year and you are likely to lose quite a few trees, but if you had a tree that started growth at once, the chances are that there would be a far larger proportion of the trees grow.

PROF. CROW: That slide represented the method adopted by Mr. Harold Jones.

MR. HAROLD JONES: The idea is to keep that central leader, carrying up the lateral branches in a swivel, repeating the operation twice or three times, and then eliminating the central leader altogether. We are subject to very severe ice storms in the fall, and we find that where we prune to an open head the trees split with the ice storms and sometimes by an overload of fruit. I think we have a stronger tree by my method, and a tree that will live longer than where you have an open head.

MR. KYDD: How far above the side branch would you cut off the leader?

MR. JONES: I would strive to get another swivel of laterals, not having them opposite one another, and no closer than six or eight inches apart.

PROF. MACOUN: Do you find any difference in the time the tree starts to grow?

MR. JONES: I have observed the central leader is the first to force the leaf bud in the spring of the year.

MR. HAMILTON: The point made by Prof. Macoun and Mr. Jones is one that cannot be too strongly accentuated. It is a new one to me, and seems to be applicable to this season, which has been most disastrous in our locality. We lost 25 per cent. of our young trees by reason of drying winds. If we could have saved a large portion of them by leaving a central leader ready to go on with its growth at once, it would have been an important factor.

MR. DEMPSEY: I leave a central leader, and I find the trees come on better.

MR. JONES: I adopted that system to overcome the ice storms that we are subject to, and I find I have a healthier tree in the trunk than under the old open-headed system.

MR. STEWART: The little sap that is left in that tree goes up that leader, and all the sap goes to the top, and it cannot get any more sap until it makes root.

PROF. CROW: That is one side of the argument, but under certain conditions it is a great aid for the tree to have strong buds which start growing early.

MR. STEWART: There is just a certain amount of sap in that tree, and if it all goes to the top, the rest of the tree will be in bad shape.

MR. LICK: If you have a vigorously growing tree that has an extra supply of material you are perfectly safe to take off the whole end, and the tree will be ready to supply moisture and plant food; but if you have a tree that is not vigorous, you should leave a central leader to help you along.

PROF. CROW: This slide shows a number of trees which were used as part of an experiment to find out the best method of pruning tops of young trees at planting time. That experiment was also repeated concerning the treatment of roots. The planting conditions were not favorable, as the spring was dry and hot, but the experiment indicates to me that under unfavorable planting condi-

tions, the more we take off the top of the tree, the greater the percentage of success we will have in planting. Of course, that is subject to a limit; but under severe conditions, with spring planting in hot weather, I am quite convinced we should cut the tree fairly hard and should not leave on too much.

BUSINESS METHODS FOR THE FRUIT GROWER.

G. E. McINTOSH, TRANSPORTATION EXPERT, FOREST.

Are you making as much money as you should? If not, why?

In the great army of agriculturists in the Province of Ontario, I wonder how many adopt business methods in connection with their farms, or how many at least have applied to the fruit growing branch of this great industry a business system, whereby they have specific information on the operation of that one branch.

There are in Ontario 13,460,863 acres of improved farm land giving employment to nearly two million souls. The products of this tremendous concern are valued according to latest statistics, at \$271,611,509, and yet this great industry is being carried on without an executive head in the way of organized interests. Is it possible that such conditions can exist and the producer receive all that is his right, when every branch and every channel into which these products pass after leaving the producer's hands—transportation companies, commission firms, etc., are each a fully organized body, conducted upon most modern business principles, the intermediary being between the producer and the consumer, who alone are working on a sure basis.

The average fruit grower of Ontario is not a merchant. He is a producer, placing on the market a product that has an average valuation of \$12,000,000. As such he should have a clear knowledge of his business and be in a position to know and know definitely, not only the cost of production, but every detail in connection with that business. Business methods applied to the orchard would permit the grower to know exactly the minimum price at which he could market a barrel of apples or a basket of peaches and not incur a loss. Would it not thus determine the price at which the grower's fruit is to be sold, just as every other substantial producing business considers cost, adds a reasonable profit, and thus determines the selling price? In other words, would it not put the grower in business for himself on a business basis?

In all lines of manufacturing, the first and most important thing to know is the cost of production. Why is it not equally as important in the orchards? Perhaps you did not make as much money last year as you thought you should, and yet how many can tell just why they did not. You have some idea, perhaps, but few have records to verify that impression. I believe there is a way it can be done in the fruit business with as great results as in any other business, and I venture to say the work of keeping such records would not be too cumbersome to apply to the orchard.

Your business methods should furnish guiding information. At the close of a day or a week or a month you should know the exact standing of that orchard in a business sense. It should enable you to keep a close check on your business. You should be able to run your orchard more profitably and to buy or sell more

intelligently. A business method which would furnish up to the minute records without delay and extra work should cost but a trifle, and should not require a college student to perform the work.

The cost of production is to my mind one of the important branches of orchard work, which is not receiving proper attention. How is the improvement to be made? That is a point upon which considerable discussion has from time to time taken place. My own opinion is that it should start first in our Public Schools. The boys must be taught more agriculture in the rural schools, particularly, and that branch of agriculture for which the boy is most interested. This is being done now to some extent, and I am glad to say the results are surprising.

Somebody may ask: "Is there not a danger of making too much of the boy on the farm?" Such a questioner cannot know very much about either the boy or the farm. A few years ago the United States Secretary of Agriculture brought two lads from Southern Carolina to Washington, and presented them with diplomas because Jerry Moore had raised 228 bushels of corn to an acre (the world's record for yield) at a cost of 43c. a bushel, while his companion, Archie Odom, had raised 177 bushels to the acre at a cost of only 23c. a bushel—thus showing a world record for profit per acre of corn. These boys adopted a business method. They knew in every detail what their enormous crop cost to produce, and were even summoned before the Agriculture Committee of Congress to explain their extraordinary success. It is then to the rising generation to which we more particularly look to pull the agriculturists and the fruit growers out of present day unbusiness-like methods and adopt for the operation of the orchard, business principles, simple and effective in their workings, that will appeal to the producers. That this is essential for the proper carrying on of the fruit business is, I believe, too evident to admit of question.

Organization and co-operation are also business methods that have been sadly neglected among our fruit growers of Ontario. In this respect we are a long way behind our friends to the south, and also growers of other Provinces in our fair Dominion. It is a reasonable estimate that the fruit crop of Ontario the present year was worth \$20,000,000. There is no possible way of conducting such a business without proper organization. How can this be done? The Central Association is doing good work. No question of that. But are we following a good business method in our system of organization?

We have our local associations, some 53 or more in the Province. Then we jump to the Central. Has it ever occurred to you that considering the large area covered by these local associations there should be a distinct association to act as a medium between the local and the Central? I merely throw out this suggestion to open up discussion.

Transportation, crop distribution and marketing are important problems in connection with the industry which you represent, and it is only by organization that you can hope to meet them. Experience indicates that while a community which grows general farm crops and is fairly prosperous cannot be organized and the organization successfully held together: the one founded on a special industry such as fruit, dairy products, eggs, etc., obliged to unite to protect their interests can be successfully organized for business purposes. The operations of the California Fruit Grower's Exchange furnishes a splendid example. This organization has been operating for probably twenty years, starting with the smallest possible nucleus, in a single market, and extending year by year, market by market,

trade by trade, until its connections now reach out through the entire country. It comprises 17 district associations, composed of 115 local associations of from 40 to 200 members each, distributing and marketing under the best possible conditions 65 per cent. of the fruit products of that state. Business methods have made it possible for this organization to sell in the past eight years \$115,000,000 worth of fruit and only lost in uncollected bills and in other ways less than \$6,000, while the total selling cost for 1912-1913, including the expense of the district Exchange, was only 23½ per cent.

Business methods enabled the fruit growers of Nova Scotia a year ago to realize an average of \$3.27 per barrel for all varieties of No. 1 at a marketing cost of only four cents per barrel.

British Columbia has solved the problem of meeting American competition in wholesale and jobbing channels by organization.

Just one year ago, born of necessity, the North Pacific Distributors came into existence, and the fruit growers of Oregon, Washington and Idaho went into business on a business basis. Last season they marketed 3,958 cars of fruit, at an average price of \$1.26 per box f.o.b. shipping point, for all varieties, all grades and all sizes. Of the total shipment of 3,958 cars, 2,102 cars (53 per cent.) started on f.o.b. orders, 1,790 cars (45 per cent.) were started on tramp cars, but 3,284 cars (83 per cent.) were delivered on an f.o.b. basis—while only 2½ per cent. or 92 cars were delivered on consignment.

Here in Ontario we have been lulled to sleep and failed to keep pace with the times and constantly changing conditions, until fruit growers must now ask themselves this question: Are they not laboring under suppressed competition maintained through dis-organization and a poor business system, selling as most farm crops are sold even now, to a local buyer or to a representative of distant firms or consigned on commission to markets many miles away, and receiving as returns in many instances bills for freight and selling charges? In so far as marketing the fruit crops of Ontario is concerned, we are to-day just where the fruit growers of California were twenty years ago. At that time, with 5,000 carloads of fruit to market annually, they thought that over-production stared them in the face, and the stability of the industry was questioned, but the real trouble came through bad distribution and an inadequate local system of handling.

We have heard of a threatened over-production of fruit in Ontario, in fact in the Dominion. My opinion is there should be no such word in our thoughts, much less in our vocabulary. True, the word is in the dictionary, being there defined "supply beyond the demand." Let it remain with Webster, it belongs to his time, and is a word that grates on the nerves of the growers. Let us as Mr. DeVere Fairchild, of North Yakima, says, adopt as our descriptive term "under-consumption." This word is found in the same dictionary and is defined "consumption of less than is produced." I think the term belongs more to our day. It describes the same condition but is more hopeful in its tone, and it gives us a clue which is to lead to the solution of the problem. We all agree that in the apple crops the present season the supply exceeds the demand. It will be so again, and yet again, unless we apply sound business methods in the administration of this industry in which millions of dollars are invested.

The question of distribution is probably one of the greatest problems before the fruit shipper or dealer to-day, and if effective distribution is ever to be settled, as was pointed out by Prof. Broderick at the Dominion Conference, there must be a getting together of shippers, whereby a central distributing agency will be established, and shipments placed as the market demands. When a dealer who

holds the fruit but a few days and passes it out over the counter at a profit in excess of the man who plants, cultivates, prunes and sprays the orchard, harvests the crop and maintains his skill and vigilance through years of toil, or the transportation company that carries a barrel of apples 146 miles and receives 15c. more than the producer, ask yourselves if there is not something wrong with present methods and something wrong with the system of distribution.

Seventy-five per cent. of the manufacturing business is now incorporated. Many of the corporations have consolidated into larger corporations. The corporation is the exception in agriculture, and the fruit growers of Ontario have the task of organization largely before them. We have as I said before some fifty-two co-operative Fruit Growers' Associations in Ontario. It is not enough, although a fair start. Let the work of organization then proceed, and in this probably a more aggressive movement on the part of the Government might be in line; the central Association is making a start, but I believe only thirteen local associations co-operate with it. Certainly not sufficient to make its importance felt in transportation, marketing, or distributing matters, and in this movement are our methods of doing business aggressive enough? Naturally as was intimated at the Dominion Conference, fruit growers and farmers are suspicious of one another in the face of an undertaking of which they have little knowledge. We need a Provincial-wide campaign to preach co-operation and organization—a get-together movement. A large percentage of growers have not yet grasped the principle of brotherhood, and economic democracy underlying co-operation. I am convinced that only undying vigilance, and an organized educational campaign will place the growers upon the solid rock of assured success.

The fruit grower is a manufacturer of a raw product, each orchard is a factory and every tree a machine which produces a certain variable quantity of perishable products. In Ontario the success or failure of over 600,000 stockholders, probably a million and a half wage earners and the dividend on several millions of dollars invested in this concern of considerable magnitude, depends upon the stability of the industry; let us then adopt for its guidance the best possible business methods, and this I believe can only be accomplished by a more united co-operation, through which at least 75 per cent. of the crop can be controlled. This accomplished and the fruit producer given a fair deal by the transportation companies, Ontario fruit growers will become a power in the business life of to-day.

Men directly in charge of a certain work however are often too near to see its problems in direct proportion. Therefore get the right focus on your business. A nearby hammock will obscure a whole mountain range. The point of a lead pencil held at arm's length will cover the aeroplane four or five thousand feet in the air.

Stand above your work. Look down into it, not at it.

MR. PEART: On the subject of the cost of producing a barrel of apples on the tree, we have done some figuring in the Burlington District, and taking the average well kept orchard for a period of five years, each tree in the orchard gives an average of two barrels per annum, and placing the cost of the orchard at \$500 per acre, we figure, everything considered including insurance, that the apples cost us \$1 per barrel on the tree, and it costs \$1 a barrel to take the apples off the tree, sort them, pack them and haul them to the station and load them on the cars. It costs \$2 a barrel to produce apples and load them on the cars.

MR. McINTOSH: I was interested in a statement I saw in the papers of a car load at \$1.30 a barrel. If that is the case, I think the growers had better stop packing the apples because the packing, picking and the barrel runs to 63c.

SPRING VS. FALL PLANTING.

F. M. CLEMENT, VINELAND.

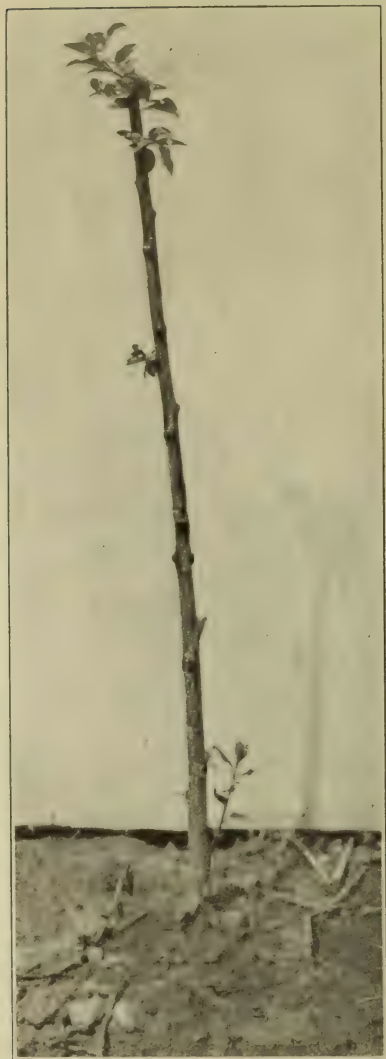
Spring is the generally accepted time for the planting of fruit trees—apples, pears, plums, peaches and cherries. Of late years, because of the heavy loss in spring planted cherries, a few of our authorities are recommending fall planting. The idea is gaining, and from my own observations and experience I feel quite safe in saying that with proper soil conditions the percentage loss from fall planting will be less than from spring planting. But the cherry is exceptional among fruits, in that growth starts very early in the spring, and when once the buds have swollen or burst it is practically impossible to get a large percentage to grow. This is particularly true of the sweet cherry. Other fruits do not start so quickly and then even though a few buds are swollen or burst the loss with careful planting is comparatively small. We must then look for other reasons before recommending fall planting.

There are four factors to be considered, (1) The availability of well ripened nursery stock that can be delivered in mid or late October. (2) The time or labor required to plant. (3) The soil in which they are to be planted. (4) The climatic or weather conditions to which the newly planted trees will be exposed during the winter. Nursery stock is usually readily available in the fall of the year. This year was as exceptional as we are likely to get for some time. A warm fall kept the trees growing until late, and yet we have been able to obtain 200 well-ripened apple trees, as clean and likely a looking shipment as I ever saw. These we planted this week—the first week in November. They were delivered to us the third week in October. One nursery firm to whom I wrote did not care to take orders for fall delivery, but I am quite willing to assume all responsibility.

We cannot argue without reserve that there is more time to plant in the fall than in the spring. It may be so on many farms, but I have not found it so in my experience. Fruit picking, fall plowing and cleaning up the year's work fill every hour just as full as the hours in the spring. But fall work can often be delayed a few days without loss. Spring seeding and planting must be rushed. It is much easier to take a few days from late October and early November than from late April and early May or even late May and early June. Labor is also more plentiful in the fall than in the spring.

The soil factor is important. Some difficulty may be experienced in harvesting the year's crop, plowing and preparing for the trees. It is taken for granted nothing would be used but a field that had grown a hoe crop the immediate summer. The trees may then be planted and plowed up to at once. It is absolutely essential that all standing water be kept away from them. Be careful to open all ditches and run the cross furrows. This is essential even though the field may be well underdrained. Surface water often does as much or more damage than soil water. Bank the trees up to a height of about eight inches with soil and then mulch the manure close around the mound. This will afford ample protection to the roots. Don't prune the tops. Leave them just as they come from the nursery and cut away all damaged or dead parts in the spring.

The weather conditions are quite largely the deciding factor. They vary greatly over the Province and a discussion of them will lead us into a discussion of winter injury. Let it suffice to say here that winter injury is largely the result of dessication or drying. Largely so but not entirely. But it is the factor we



Fall vs. Spring Planting. The tree on the left was planted in the spring; that on the right the previous fall. Photograph taken in midsummer of the first year.

have to deal with in the fall planting of nursery stock. A certain amount of evaporation takes place even on the coldest days of winter. This must be made up by a flow of water or sap from the roots upward. Infinitely small as this flow may be, on the bright warm days it is sufficiently heavy to make up the loss of colder days. The mulching prevents deep freezing and freezing and thawing of the surface soil. It also aids in retaining moisture.

Experiments conducted at Vineland on plums and pears show a decided advantage in favor of fall planting.

Six Reine Claude plums and six Bartlett pears were planted in the falls of 1911, 1912 and 1913. Duplicate check rows were planted in the springs of 1912, 1913 and 1914. In every case there is a difference in favor of the fall planting.

The following table showing the results on the plums may be of interest. The trees are yet too young to bear fruit, but the growth of the longest planted trees this summer is a fair indication of the value of the one time of planting over the other.

Dynamited Holes, 1912.			Spring Planted, 1913.		Autumn Planted, Fall of 1912.	
	Diameter of Trunk.	New Growth, 1914.	Diameter of Trunk.	New Growth, 1914.	Diameter of Trunk.	New Growth, 1914.
Tree 1	1.11	188½	1.58	299	1.66	266¾
" 2	1.11	164	1.75	278	1.66	338
" 3	1.43	317½	1.41	138½	1.58	255
" 4	1.27	222	1.34	216½	1.66	274½
" 5	1.34	216	1.43	161¾	1.75	237
" 6	1.27	209	1.58	274	1.75	266½
Total	7.53	1,317	9.09	1,367¾	10.06	1,637¾
Average	1.255	219.5	1.51	227.9	1.67	272.9

No trees have been lost in the fall planted rows and only one in the spring planted; none in the dynamited.

In connection with this experiment we have also been testing the value of dynamiting holes for fruit trees. The above table gives the results to date. At present the trees are smaller and making a little slower growth than either the fall or spring planted, but I do not care to draw any conclusions as yet. I attribute the smaller growth of the trees in the dynamited holes to the fact that the holes were dynamited and the trees set at once. The soil was well shattered as it should have been, and consequently dried out badly, the trees suffering a setback from which they have not yet recovered.

We are dynamiting this fall and setting the trees at once in part of the experiment, dynamiting now and setting the trees in spring and in part dynamiting and setting the trees at once in the spring. This should give us a fair idea of the value of the practice.

The soil is a heavy clay with a very stiff blue and red clay subsoil.

MR. FISHER, Burlington: Two years ago this last spring we were planting trees and the people who manufacture explosives wished to give a demonstration and they made 60 holes in one row, and we watched the trees that were planted

in these holes very closely since then and we cannot see any difference whatever. The trees have grown uniformly both where the holes were made by explosives and where they were dug. What date do you plant in the fall?

MR. CLEMENT: Any time after the 15th of October.

MR. FISHER: Would you defer the date of planting?

MR. CLEMENT: I would want it done before the 1st of November.

PROF. CROW: If the nurserymen are going to induce us to plant in the fall, they must ripen the trees up a little earlier.

MR. CLEMENT: I have had a good shipment of Spies from Prince Edward County, and they were as well ripened as any trees I have ever seen.

PROF. CROW: I have seen leaves on the trees in the nursery row right up to Christmas.

MR. CLEMENT: Where the leaves are green on the trees they are not matured.

THE PRESIDENT: A question that was asked by one of our growers might be answered by Prof. Crow or Mr. Clement. It was as to the fall pruning of peach trees. There has also been some discussion as to whether grapes should be pruned early in the winter or later on. This particular grower does not know whether it would be any damage to prune his peach trees now or wait until later. It has been the custom with us to leave our peaches until later on.

MR. HAMILTON: Do you prune your grapes in the fall?

THE PRESIDENT: Yes, all grapes are pruned in the fall as soon as the leaves fall.

MR. CLEMENT: I would not like to say that it would be wise to advocate fall pruning of peaches. Even though the winter is mild there are a certain number of dead limbs on a tree in the spring. This year it was remarkably so. You might not lose by pruning in the fall, but I do not think it is advisable.

MR. ALLAN: I have never seen any damage to grapes from fall pruning. The only damage that can occur by fall pruning is the freezing back proposition. If you cut back to about five buds, and it freezes back of that it becomes a serious matter, but I have never noticed that to occur in grapes, and I do not think it makes any difference as to when you prune your grapes. In our section, we are obliged to do it at any time when we can stand the cold weather. I believe peaches are more likely to be affected by frost.

MR. ROBERTSON: I have done considerable pruning this year. We have no crop of peaches, and our land was in good shape, and I thought the best way to put them in condition for next year was to work the land up and seed it down the end of June or the fore part of July. I summer pruned them, and took out the cross branches. I was looking at some of the trees since the leaves dropped and they need very little pruning and all the new wood is set with good plump fruit buds from one end to the other. I have been following that method with plums, pears and peaches, and I think we will prune our trees in the summer time, and it will become one of the summer jobs. We are after fruit, and we can induce early bearing and annual bearing and the proper ripening of buds and better foliage and better fruit by pruning in the summer.

MR. BUNTING: I agree with nearly everything Mr. Allan has said except one or two modifications. We commence to prune our grapes about the 1st of December and keep at it until the job is completed in the early part of the next year. We try to avoid pruning grapes in very severe weather because it is hard on the men and the wood is very brittle at that time and the men are liable to break off canes. We follow on with apples, and pears and plums, and leave the

peaches until the latter part of February or the month of March. I think it is the practice with a good many peach growers to prune whenever they can. Mr. Armstrong and others in that district prune right through and they usually have good crops. I think the greater danger to the peach crop is in May rather than in the winter. I would not hesitate to prune the peach orchard in the winter if it was done intelligently.

MR. DEWAR: I agree with what Mr. Bunting has said. Commence with the grapes first. The first good frost will enable you to tell which wood is green. We then go on with the apples, then the pears, and the last we do are the peaches. We do the cherries at the same time as the plums. I generally leave the stone fruit, cherries, plums and peaches for the last. The fruit grower has got to work according to the acreage he has and the number of men he employs. If he has a large acreage to prune and he does not want to hire too many men, he must commence to prune a little earlier.

THE PRESIDENT: The only danger with the grape is leaving immature wood. There is a lot of it in some of the varieties this year.

We have here a couple of boxes of preserved cherries that were put up in Germany and sold in England at a high price. Cherries are increasing rapidly in this country and the price is coming down, and the question has been asked as to whether we could not put some of them up in this way and realize better prices.

MR. DEWAR: I brought these boxes of cherries here for the purpose of giving the fruit growers an opportunity of capturing this German trade. I have a nephew in the business in London, England, and he sent these boxes to me. If we can capture any of the German trade it will be of benefit to this country. I spoke to Mr. E. D. Smith about it and he thought that labor was too expensive in this country.

A MEMBER: This year one of the bee men told me I had better be careful when I was spraying for the saw fly. I never heard any more from him, but I would like to have some information as to the proper time to spray.

MR. CLEMENT: We had about twenty letters and telephone calls from fruit growers in the vicinity in regard to the same difficulty. If you spray when the saw fly appears, the fruit will have been almost set and at that time we had no hesitation in spraying with two pounds of arsenate of lead and water and we had no trouble.

MR. W. A. MITCHELL: Last winter a number of my Montmorency cherries were killed and I put in 100 peach trees. I am from Bruce County and I would like some information on the subject.

PROF. MACOUN: We carried on some experiments last winter to try and find out the time when the sour cherry buds were killed. They are nearly all destroyed with us in the winter. We found last year that cherries went through 30 degrees below zero without being injured at all, and it was on towards March or the middle of February when there were sudden changes of temperature that the injury occurred. They were not at all injured by the low temperature.

MR. MITCHELL: The majority of my trees were alive and they started to sprout from the roots in the spring.

MR. MACOUN: Sour cherries are nearly all propagated on Mahaleb stock, and it is not hardy.

CULTURAL METHODS.

HAROLD JONES, MAITLAND.

In the early days of orcharding in the Province the soil, rich in humus and undepleted of its natural resources, gave satisfactory crops of fruit with trees growing in sod. As time went on with intercropping of hay and grain the soil became depleted of its humus and readily available plant food, and it became more compact and less able to hold moisture until the trees declined in vigor and productiveness.

Many of these orchards were stimulated into vigor again by breaking up the sod and adding fertilizers, mostly in the form of barnyard manure, and giving cultivation through the growing season..

This system although it doubled the crop in many instances gave unsatisfactory results in some cases. It appeared to extend the growth of the tree too late in the season and retarded the ripening of the wood, and the trees were unable to endure the low temperatures of winter without injury. Root killing was also observed on soils uncovered with vegetation when there is very little or no snow covering.

To obtain the good results of thorough cultivation and eliminate the unsatisfactory results mentioned above as far as possible, cultivation should cease at or near the close of the growing season of the tree and the land sown to some cover crop.

The length of time that cultivation may be safely continued varies in different sections of the Province, but a study of the growth of the tree and the temperature in winter are the two factors to be considered when deciding to cease cultivation.

The season of growth in most woody plants extends scarcely to midsummer; most, if not all our native trees cease growing very early in the season. This is no doubt the reason why they endure the winter so successfully.

Trees that complete their growth early in the season and mature their wood and terminal bud well, are said to be "determinate" in their growth, while those of the opposite habit like some of the Japanese plums for instance are said to be "indeterminate."

It is of course apparent why plants of indeterminate growth are not hardy as a rule.

It has been observed that practically all of our hardy apple trees are quite "determinate" in their growth, forming their terminal bud early in June. It has also been observed that the vigorous growth of a tree can be prolonged past its normal period by excessive cultivation and fertilization.

The active normal growth of the tree is completed early in June. Then it settles down to ripen and mature the newly made tissue and store up plant food in its cells for the early forcing of leaf and flower the following spring.

In the colder sections of the Province cultivation should cease at or about the time that normal growth is completed, say the early part of June, and the cover crop sown. For some time after this the trees receive the full benefit of the cultivation before the cover crop has made sufficient growth to take up and hold the excess moisture and liberated plant food.

The cover crop to use is best determined by the character and the richness of the soil and the vigor of the trees in the orchard.

If the trees are growing slowly, and the land is in a good state of tilth, it is advisable to use a nitrogenous crop such as red clover or vetch with applications of fertilizer.

If on the other hand the trees are making a luxuriant growth, and the soil is a heavy loam, some non-nitrogenous crop should be used such as oats, rye, buckwheat, etc.

A good combination for most soils where the clovers do not make a good stand is 6 to 10 pounds of Dwarf Essex rape and 20 pounds of common vetch to the acre, the rape to be cut in September when the vetch will then grow to cover the ground for winter.

A cover crop in connection with cultivation is valuable in many ways: It improves the physical condition of the soil; prevents hard or clay soils from cementing or puddling; holds the rains and snow until they have a chance to soak into the land; prevents alternate freezing and thawing of the surface; adds humus that improves the chemical and mechanical condition of the soil; and renders locked up plant food available.

Some unfavorable reports have come to my notice where cabbages or rape were used as a cover crop. One case was at St. Henri, on the Island of Montreal, where cabbages were grown where the heads were cut for the Montreal market, and the stalks and leaves left on the ground. The fruit was undersized and of very poor color.

Another case has been reported by the District Representative for Durham, where an orchard sown to rape and vetch gave undersized fruit of poor quality. In other cases the results have been very satisfactory, notably in my own orchard, and at the Central Experimental Farm, Ottawa.

I would be glad to hear a discussion on this point as something of value may be brought out.

MR. KYDD: Mr. Duncan's orchard in Durham County has not had any cultivation for twelve or fifteen years, and he has grown very successful crops of McIntoshes and Snows.

MR. JONES: In regard to St. Henri, reference was made to Robert Brodie's orchard. He had been growing successful crops of Fameuse in sod, and had quite a trade in vegetables in Montreal. He plowed up several acres of this Fameuse orchard and sowed it to cabbage and cut the heads and left the leaves and stocks on the ground. That year where the cabbages were grown, the trees grew an immense crop of fruit, but it was under-size and of a dull green color, and he said it was absolutely useless, whereas the rest of his crop was of good size and marketable. In Dundas, Mr. Bradt has had phenomenal success with these cover crops that are sure to grow.

MR. W. L. SMITH: Acting under the advice of Mr. Jones, I used that cover crop, and it is the most satisfactory I have ever grown. I think the trouble in Mr. Duncan's orchard was that the cultivation of the cover crop ceased too early, hence the fruit was not matured. I would have suffered a great deal by ceasing cultivation too soon. It should be continued at least until the end of June in a normal season in Durham County.

MR. JONES: I believe that the period of cultivation should vary in all the different sections of Ontario. I found very serious results in my orchard by the practice of continuing cultivation to the 1st of August as we were taught to do in the early days of this Association. I had immense crops of fruit, sometimes rather under color, although of good size, but I lost a number of trees by winter killing, as the trees went into winter in a green, unripened condition, and the leaves hung on until about Christmas. In some cases the snow had a tendency to break them down and in the spring, there was plenty of frozen wood so that

it did not take long for the trees to die out completely. Since I have continued vigorous spring cultivation and then stopped, I have had much better ripened wood, and my trees as a whole have been hardier.

MR. W. L. SMITH: You have more moisture down in Eastern Ontario than we have.

PROF. HUME, Toronto: Might it not be possible that the injurious effects of growing cabbage and so on were due to the sudden change from the method of sodding and the breaking up of the sod?

MR. JONES: I do not think there is a sudden change. I do not think the sudden change could make the difference; last season was very peculiar; it was very dry and when rape is growing readily it draws moisture very rapidly from the soil, more so than any other crop except corn, and that may have affected Mr. Duncan's crop.

PROF. MACOUN: We have been using rape and vetch in our orchards for eight or ten years, and find it very satisfactory. We put it in every year, but we find it difficult to get our cover crops sown much before the last week of June because we want to cultivate the ground a few times. In Eastern Ontario, the earlier we can get our cover crop in the more sure we are of getting the wood to ripen, which is a most important thing down there, because if they grow late, we are almost sure to lose them.

DIRECT TO THE CONSUMER.

W. H. BUNTING, ST. CATHARINES.

In the early days, the chief efforts of this Association were to educate our people to grow good fruit and plenty of it, to eliminate from the large variety of trees those that were undesirable and to select and perpetuate those that would prove worthy of further propagation. That work has been followed up until to-day we know pretty well in the various districts of this Province what classes of fruit we can grow successfully. The fact that we are producing the present varieties successfully and in large quantities and have secured such a reputation for them is sufficient evidence that the work has been well and truly performed. It is not possible that we have reached the acme of perfection, for the experimental work at Jordan and Ottawa will, no doubt, as the years go on, bring out still more desirable varieties of fruit. But apart from that, we have a large variety of first class fruits to such an extent that the question of markets and distribution is becoming a very live issue. The time has come when we should pay more attention to organization and systematic marketing of those products if we would get out of them all we are entitled to.

I took exception on Wednesday to the statement that 40c. was a satisfactory price for apples except in the time of emergency, when it helped out in a particular instance. If we are going to go through all the operations that have been inculcated as to the successful production of fruit, we must have a fair return for our labor, and I am sure that the public are quite willing to pay a fair price for a first class article under ordinary conditions; and if a year like the present should occur again, it will be an incentive to us towards increased effort in the future. At present, we have various methods of distribution of our product. We have

first, the system that was first in vogue, and which will be in vogue for a long time to come—the sale of fruit on commission. For many years I have shipped a certain proportion of my fruits to commission houses; and where the commission man is carefully selected and is an honest, reliable man, I find it a very satisfactory way of disposing of a large quantity of my fruit which could not be put on the market by any other method without more attention than I could give to it. The commission man has his place, and though it may be necessary to put further safeguards around their business than we have at present in order to protect the average shipper, the question of the survival of the fittest operates through, and the man who conducts his business in an honest way and has the confidence of the shipper, will continue to do business.

Then in some sections of the country we find the larger dealers or growers have been in the habit of issuing quotations direct to the retail trade throughout the Dominion, weekly or oftener as the case requires, for the purpose of soliciting orders for the goods they have in season. That method has proved very satisfactory in disposing of large quantities of fruit. That method applies largely to individual businesses and the general public are to some extent at the mercy of those men in the purchases that they make. The law of supply and demand operates there and while they serve a very good purpose, they do not cover the ground entirely.

Then we have had during the past few years co-operative societies which have, especially during the past year, proved their usefulness to a very considerable extent, and it will be very desirable that more of those societies are formed in different localities in order that the individual grower may be able to bill his fruit with his neighbors, and thus secure a market that he otherwise could not reach. To my mind one of the great causes of the demoralization of the apple trade this year is the fact that the men in Ontario who have smaller or larger apple orchards on their farms, who are growing fruit as a side line and who do not give the attention to it that a specialist does, and who have been led to depend for years upon a buyer who would come at the proper season and buy their entire crop and handle it for them, and pay them for it and take it away without any further trouble, have not been approached by these buyers. This class of fruit grower is absolutely at his wit's end to know what to do with the product that he had never been in the habit of disposing of; hence the fruit was left largely to waste. That is why the report was spread through the country that thousands of barrels of apples were rotting on the ground. That condition of things should be done away with. I do not think it is in the interest of the fruit producer or the general public that that class of business should be countenanced or approved of by this Association.

Another avenue that has been taken up particularly lately is the car-lot trade with the Western Provinces. Our own Association at St. Catharines was the pioneer in that trade which has grown to very great proportions. Other co-operative organizations have grown up throughout the Province and taken advantage of our experience. That is a business that is bound to increase as the immense country to the west of us develops and becomes more densely populated.

Another outlet for our fruit is the overseas trade. This year owing to war conditions that avenue was very seriously demoralized and caused a great deal of loss and trouble to many shippers who have been disposing of their fruit by export trade. I think we were more afraid than we need have been of the possibility of disposing of certain portions of our crop in the Old Country

markets this year. I made a few shipments to Scotland and my reports have been favorable if not very optimistic, and I hope to have a fair return for my effort.

Coming now to the subject more directly assigned to me, for the last few years, I have been making some effort to get away from the profits of the middleman on a certain portion of my product. I felt I was taking particular pains with a good deal of my fruit and was entitled to a little better share of the proceeds than I was getting in the ordinary way. It seemed to me that there was an increasing number of people in the larger centres and scattered through the country who were not getting the better class of fruits in such a condition as they would like and who would be willing to pay a fair price for a first class article delivered to them promptly and efficiently with a guarantee behind it. With this idea in my mind I have been endeavoring to work up a trade of that kind during the past few years. It has not been a large trade, but it has been satisfactory to me and has been growing from year to year. As I had secured quite a considerable number of customers, I was deluged with letters this year asking if I could not send them peaches as I had done heretofore, notwithstanding the announcement through the papers that the peach crop in the Niagara District was a failure this year. I received so many letters of this kind that I was obliged to take advantage of the press and announce that we had no peaches, but that I would be pleased to supply them with other classes of fruit just as good. That experience shows the advantage of establishing a trade direct with individual customers.

There are two or three essential factors in the successful prosecution of a business of this kind. A man must have a good article to supply to his customers. In my trade I have endeavored to supply only the choicest quantity of fruit in each case. Then it is necessary to inform the public that you have a fine product. I have found the daily papers the best medium for such publicity and while I have not done very extensive advertising, I have been careful in selecting my mediums in order to reach the portion of the public that I wish to influence, and in that I have had reasonable success.

Having once secured your customer you must take such measures as will retain him, and my method has been to do a little better by him than perhaps he expected, for I find that a satisfied customer has been one of my best advertisements. I have had repeat orders not only from year to year but during the same year for other varieties of fruits, and I receive letters speaking of the quality of fruit and the treatment customers have received, and these have been a great satisfaction to me. I would say to our younger men who wish to enter into this class of trade that they should follow closely all the methods inculcated by the professors and leading men of the trade in order to produce a first class article; then make it known to your public. Then having once secured your customers, do all you possibly can to retain their confidence from day to day and year to year. If this plan is carried out, I am satisfied that others will get as much satisfaction in that particular side-line as I have myself.

MR. ROBERTSON: How much more business can you do if you had a good express service? Do you find a falling off in your business on account of the unsatisfactory handling of your goods by the express company?

MR. BUNTING: That is one of the serious obstacles in this line of business. You may do all that is possible to get a good crate, packing it as well as you know how, but the minute you hand it over to the transportation company, it is beyond your control to a very large extent, and very frequently it is at the

mercy of men who care very little for you or your customer. This year a case occurred that I was obliged to take to the President of the Canadian Express Company in order to get redress. I was delivering packages of that kind personally to the express company, handing them over to the messenger who was not only throwing the packages but kicking them across the floor of the car. I called his attention to it and received some impudence from him, and reported him to the chief messenger. A week after that I was again delivering some goods for a customer whom I have supplied for thirty years, and in this particular case, he piled the packages up in a corner, about eight high. I called his attention to the fact that the car was practically empty and that the first jolt it got, the pile of baskets might be down on the floor, and I asked him to place some of them on the floor and as occasion required they could be put up. I got some impudence from that same man again, and was obliged to take the matter to the Superintendent, and the President of the Express Company. I got the man's name and reported him and asked that he be dismissed. I got a letter from the Superintendent saying that that would not occur again. These are some of the things you have to contend with. The only redress we have at present, as far as I can see, is to take notice of claims of that kind and follow them up. If you compel the companies to make redress, you touch their pockets, which is the only place where you hurt them.

When I was carrying on the work that Mr. McIntosh is now doing, I found the same trouble which he complained of, that of getting fruit growers to keep accounts of matters of this kind so as to get definite information on which to base claims. The details should be given very definitely and accurately. I think as the years go by, that matter will be overcome.

MR. HAMILTON: I understand that Mr. McIntosh, who has charge of transportation matters, stands ready to follow up any claim for shortage or excess of charges or loss or damage.

MR. MCINTOSH: I will be very glad to do anything I possibly can to assist any individual shipper, but of course they must make their own claims individually. It will be impossible for me to handle all the claims that occur throughout this Province. I believe rough handling is one of the most serious problems in connection with the fruit industry. I feel deeply concerned in the bill we have now before the House; and if that bill goes through it would be possible for Mr. Bunting to bring before a magistrate the express messenger who did that rough handling in his case and make him liable under the criminal code. It is a shame that a fruit grower has to spend a long time becoming proficient in the production of his fruit, and as soon as he hands it over to these companies, it is at their mercy. From records sent me last year, about 10 per cent. of the shipments are pilfered. I estimated a loss on that of something over \$10,000. My post office address is Forest, and I would be glad to give any information or do anything possible.

MR. BIGGS: I have had a little experience with express companies. My brother received an order from Port Arthur for a box of peaches, with the money. He spoke to the agent at Burlington who said, "Well, we cannot guarantee its safe delivery; the chances are it will never get there—that the employees will steal it." My brother returned the money rather than take the trouble. I told him I would have shipped it through and followed it up to its bitter end. That is the only way that we can ever bring the express companies to time. It looked to me absurd to think we had the money in our hands from Port Arthur and yet we were told by the agent of the Express Company that they could not

guarantee its safe delivery. My brother said, "I have had some experience with express companies and it will take more time and money to get that through than the fruit is worth, and I prefer to return the money." It is a sad commentary on the effectiveness of the express companies in this Province. I think they can be brought to time if we follow up every case and see that it is looked after properly. Here is the place to do that, especially when there is a big force behind it like this Association, which can accomplish what we could not do individually.

PROF. HUME: I have never yet had a barrel of apples delivered to my house that had two men to take it down or a slide by which it could be let down from the waggon, but I have had barrels dumped down and smashed in. The teamsters claim that they do not have to deliver such goods into the consumer's house, that they have only to put them on the sidewalk. One fellow delivered mine on the boulevard and burst one barrel, and I insisted that he must put them over against my house though he claimed he had delivered them, which I denied. They drop the barrel down and ask for a quarter to put it in the house, and as there is usually only a woman at home, we are held up in that way; 25 cents is a pretty large holdup for a single barrel.

MR. FOSTER: While it is true that the quickest way to reach the companies is through their pockets, the difficulty is to get to that point. It takes the patience of more than one Job to follow up all these cases.

MR. BUNTING: We should have our own spotters on these trains.

MR. FOSTER: I think that would go a long way. We should also carefully preserve data and particulars of these troubles as the days go by; then we would have something to work on without hearsay or guessing, for the Superintendent will not listen to anything that is not definite. This proposed legislation forcing employees on trains to handle fruit carefully subject to penalty, would have some effect, but we have got to get the feeling of the communities behind that view. The local associations should take this matter up and acquaint their members of Parliament with the situation and the hardships and impress on them the necessity of such a measure. It makes me sick to go to the station with a load of fruit that has been carefully handled and see it abused the minute it gets on the platform. I believe the head officials are really sincere when they say they have instructed their employees to do the right thing; but they will not do it, and it is up to somebody to see that they do it.

THE PRESIDENT: An ordinary fruit grower will not take the time and trouble to follow up these claims, but if we as an Association or a body of shippers at St. Catharines or Grimsby or elsewhere got together in the early part of the season, and a dozen or two of us agreed to go together and put in our claims in the name of that body, we would avoid the trouble spoken of. When Mr. Bunting or anyone makes a complaint against any employee, he incurs his illwill, and when the superintendent's back is turned, he will get it in the neck every time. I have found this to be so personally because I have got it myself. I have almost given up going to the Express Company, because it is practically impossible to send shipments satisfactorily to smaller points.

THE FRUIT BUSINESS FROM THE RETAILER'S POINT OF VIEW.

D. W. CLARK, TORONTO.

I must confess to a little surprise when your Secretary asked me to give an address as a representative of the retailers at this your annual convention. It is a somewhat new departure as far as I know, and I trust it will work towards a better understanding between the fruit and vegetable growers on the one hand, and the retail grocers on the other.

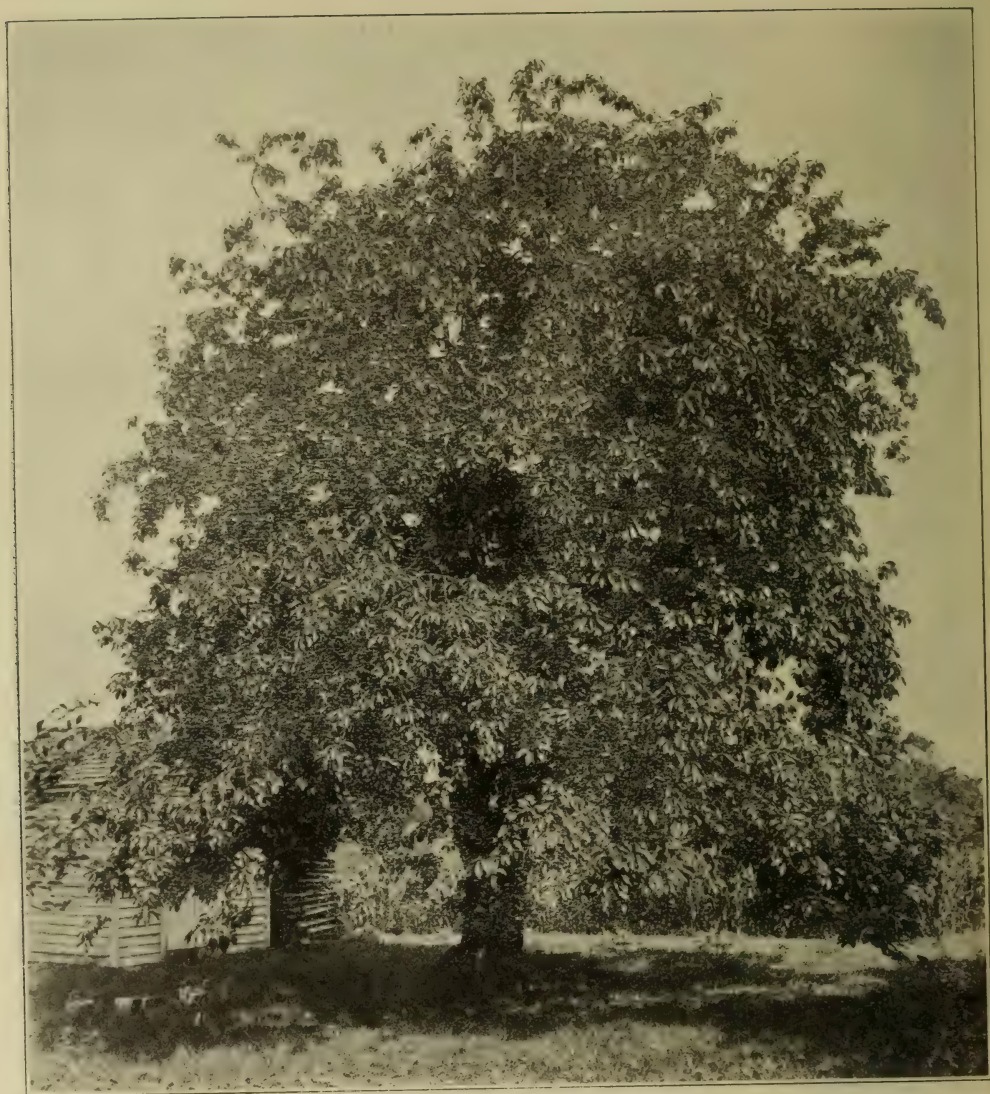
I regret that you have not your display of fruit as in former years, because all such publicity helps to advertise it and hence sales are increased for both grower and dealer.

You know there are many people under the impression that if the grocer buys an article for 99 cents and sells it for a dollar he is making a profit of one cent. Such is not at all the case. I have been in the grocery business in Toronto over thirty years, and from my own experience, and the experience of others in the trade, the expenses of a grocer reach from twelve to eighteen per cent. on the turnover. So that if a retailer sells a basket of fruit for one dollar, he must figure that from the time that basket entered his store until it was handed in at the door of the consumer, it cost him anywhere from 12 to 18 cents. Suppose it cost him the average, 15 cents—you can see that if the first cost of the article was 85 cents, and he sold it for one dollar he is actually just breaking even and no net profit whatever has been made.

The overhead expenses of a retail grocer include many items. There are wages to be paid the manager or proprietor, and the selling staff; there is rent, or interest on investment; light; fuel; the up-keep of delivery horses and waggons, and driver's wages; taxes; insurance; store equipment and fixtures; depreciation on everything; stationery, stamps, etc.; bad debts which frequently necessitate the writing off of considerable money; and sometimes unforeseen occurrences such as the death of a horse or the smashing of a delivery waggon in a runaway. Goods which we purchase and stock in our own stores so as to have them convenient for the consuming public must each and all bear their share of these inevitable overhead expenses. In the case of fruit and other perishable goods there is always the additional expense of waste to be added, for no merchant, no matter how careful he may be, can gauge his purchases and sales correctly at all times.

I think you will all agree with me that the consuming public would not buy as much fruit and vegetables if they had to get their supplies direct from the country. The attractive displays of the retailers of Toronto every season are undoubtedly responsible for the great majority of sales, and if there were no displays to tender suggestions to the people, the consumers were left upon their own initiative to write or wire to the country for supplies, there would be a large amount of stuff go abegging. I would just like to see the retailers of the country give up the sale of fruit and vegetables for one year, and allow the consuming public to send to the country for everything they wanted. You can depend upon it, there would be very little fruit consumed that year.

If, then, the retail grocer is a necessary link in the chain of fruit and vegetable marketing to secure the maximum turnover, the next question to decide is the cheapest and best way for fruit and vegetables to reach his store. You growers appreciate the fact that to obtain the maximum benefit from your crops, the harvest you produce should all find its way into consumption, and at prices that



A Sweet Cherry Tree in Norman Moyer's Orchard, Jordan Harbor—circumference of trunk, 5 feet 7½ inches; height, 39 feet 4 inches; crop, 43 11-quart baskets in 1913 and 50 in 1914.

will bring you a reasonable net profit. If you produce more than a market can be found for, you lose. If the prices you receive do not pay you a net profit, you lose. Your aim is quite clear.

My opinion is that fruit can be more satisfactorily bought by the retail dealer from the commission merchant. It seems to me to be the only fair way for you to market your goods. My reason is this: when the merchant buys from one party at a distance he has no choice in appearance and quality. The goods may be satisfactory to-day and to-morrow they may bring all kinds of complaints from consumers, and you must remember that we make good to our customers anything that is not right. Melons may arrive too ripe or too green; peaches may be off color, etc., and as we are the final distributors we get the blame. If we purchase goods we cannot conscientiously recommend, we must lose in the price.

But on the other hand when goods are bought from the wholesale market when competition is keen, we have our choice from scores of growers. If a retailer has a market for only one kind of fruit, he can personally select what he wants from all the offerings on the open market. A merchant too, soon gets to know the shippers who send in the most reliable fruit and vegetables, and at the commission house he has the opportunity of obtaining his daily supplies from one or another.

The dealer must also protect himself from the standpoint of price. Should he purchase direct from one shipper, he pays the one price. But on the commission market the prices are up to-day and down to-morrow, so that if the price a merchant has paid to his own shipper happens to be higher than the ruling commission market quotation—as it would frequently be—he must cut his retail price and lose his net profit. It is therefore much the safer method—despite the recommendations of many of the daily papers, and others, ignorant of the situation—and surely the most satisfactory method to buy our fruit and vegetables.

No doubt some of you will be able to point to instances to the contrary, but for the best interests of the larger section of the growers and retail dealers, the marketing system I have outlined must prove the generally accepted one.

The majority of us like to be commended for the good things we do, but we are usually loath to hear of these things that ought not to have been done. Nevertheless let me recall a few errors of commission, and errors of omission, that the fruit we frequently receive in our stores point to. Sometimes, for instance, we receive boxes of berries a little better than half filled. Out of a crate of 27 boxes it may require three or four boxes to fill up the remainder in order that we can offer them to our customers without fear of complaint. Suppose a crate of 27 boxes cost 13 cents. That would mean a total of \$3.51. Suppose we were to sell the remaining 23 boxes that have been filled up at 15 cents per box, or an advance of 2 cents—which is the usual margin—we would only receive \$3.45 altogether. That would mean a loss on the first cost without taking into consideration the cost of doing business which is from 12 to 18 per cent. There you have an example of an error of omission. On the other hand, when we purchase berries that come from the United States the boxes are jammed full. Of course you realize that what I have said about Canadian boxes does not apply to all cases, but it has occurred frequently, and that is why I have mentioned it here. The retail grocers are in a position to give the growers great assistance in the marketing of fruit if we receive it in good order and properly packed. For the better condition it reaches us, the lower is the margin of profit we can afford to take, and the lower the price to the consumer, the more will there be consumed and that is what you men are striving for.

From my own experience, I must say that a great deal of credit is due the Leamington Fruit Growers for the fair way in which they put up their goods. Most of the shippers there are dependable, and you can be certain that the retailers soon become acquainted with the good men and endeavor to get their goods from them. Every man of course thinks his goods the best, just as every athlete thinks he has greater powers than his competitor. There are some shippers who mark their goods No. 1 whereas other producers would call them No. 2. Here we have an error of commission. If the marketing of fruit is to be put upon a satisfactory basis, as a retailer I would think that more care should be taken in this respect. We often purchase goods supposed to be as the top row indicates, but when those underneath are investigated, we find an inferior quality which we cannot send out to our customers. All of this injures the fruit business in general, and it is undoubtedly not good business on the part of the shipper. It tends to rob him of a good name he would otherwise possess. In retailing it is just the same. If we do not give satisfaction to our customers, somebody else will and we lose the trade.

There are too many disturbing influences in the trade. Supposing a man goes out to the country to visit a friend, and brings home with him what fruit he wants. He usually gets it at a lower price than the retailer can buy in quantities, and he doesn't forget to tell us about it. We are every day being gently reminded by those who have just come in from the country how cheap apples are. Sometimes they tell us they can almost get them for carrying them away. They forget that we have high rents to pay, and wages, and everything else connected with the stocking, displaying and selling of apples, and think they should get them as cheaply as in the country. It is up to the producer, if he wants to get good prices for what he grows, to help maintain prices and not to demoralize them for the retailer from whom he expects so much in the way of getting the goods into consumption.

I trust you understand the position of the retailer better in so far as the marketing of fruit and vegetables are concerned. Those of you who read some of our daily papers no doubt have seen the abuse we receive from Householders' Leagues, etc., about charging exorbitant prices. I assure you that competition is too keen in grocery staples for that. These people do not understand methods of doing business and in their ignorance create all kinds of unjust prejudice against us. In fact the service demanded by the public nowadays is one of the large factors in price advances.

I am sure you will agree with me that the retailer is a necessity in the distribution of fruit and vegetables if the maximum is to be sold in a season.

I believe in such conferences as these and I hope there will be more of them. I appreciate the honor you conferred upon me through your Secretary, Mr. Hodgetts, in inviting me here to-day to give you this talk, and I thank you for your very kind attention.

MR. CLEMENT: About what percentage of the fruit will decay in the store?

MR. CLARK: I could not answer definitely, because some days we buy what we think is going to sell during the day and perhaps the sale that day is not as good as others; therefore we have a loss by holding them over. On other days we will have to buy a second time.

MR. CLEMENT: What is the loss from decay by holding them over?

MR. CLARK: There is more loss in cherries than other fruits; I have found them decay quicker. Plums will decay, but sometimes they keep up well.

MR. CLEMENT: Would it be as much as 10 per cent.?

MR. CLARK: No, I do not think it would be that much through the whole season from my personal experience.

MR. ARMSTRONG: What conveniences have you to take a delivery of peaches on the local market? Is your waggon suitable?

MR. CLARK: Some of us have our waggons with shelves in so that we can put them in without being bruised. A good many storekeepers have fruit delivered by the commission men and it is piled anyway on the waggon.

MR. ARMSTRONG: I have repeatedly stood on the market, and especially on the Yonge Street wharf, and I failed at any time to discover any facilities for properly taking charge of those baskets.

MR. CLARK: I generally take my own fruit home, and I have a waggon for that purpose that can handle them without being bruised.

MR. BUNTING: Mr. Clark has made a valuable suggestion as to the desirability of a conference between the different factors of production and the consumer. We have not had such a conference as yet, and it would be desirable if an arrangement were made for a whole session of our Association in which the wholesale and retail men of Toronto were invited. Mr. Clark has given us some things to think about, and I believe a good many abuses can be corrected by a conference.

MR. ALLAN: The basket is very important in the retail trade, and I think nothing can be done too soon in the way of legislation to give inspectors authority covering the matter of unfilled or insufficiently filled packages. This is most detrimental to our trade in more articles than berries, for instance plums and grapes and other fruits that are not laid in. A grape basket only three-quarters full is not attractive to the buyer. I believe there is legislation considered in regard to this and the sooner it is put through, the better.

MR. CLARK: I just mentioned that one instance of berries. Of course there are others. We go to the market; a case of berries is opened and is shown us and we get it home. The second layer is not so well filled as the first, and the third not so well as the second. It annoys us. I had two or three boxes that were filled with clover leaves, with berries on the top. I do not blame the growers, but I blame the packers. In regard to green grapes, at the first of the season I think it occurs, but I do not think it is any benefit to the growers to ship out green grapes. If I get such a case as that, I would shift the fruit grower for the whole season.

MR. ALLAN: This year the blue grapes and white grapes started out on a fine basis—the Niagaras and Concords—but the Niagaras should not have been put on the market. When they go on the market green, the grocers and customers get a dose of them, and the consequence is that by the middle of the season you could not get an order for Niagaras because the first dose of green grapes was a disgrace; they were not fit for food. That also should be covered by inspection—the matter of picking and marketing fruit in an unripe condition or unfit for food. In our local association, I fathered a resolution to that effect some time ago.

MR. HAMILTON: Do you think it would be desirable or possible to adopt the English Continental system in regard to those packages—of buying by weight? We fill our boxes high and my neighbor fills his slack and gets the same price, yet there might be 20 pounds in my packages and only 15 in his. Handling by weight would solve that difficulty.

MR. CLARK: I think that is the only solution. In the case of American peas and beans and new potatoes, I weigh them when they come in and find how much they cost me and put them in boxes and I know exactly what we are going to

charge. That is the only fair way of marketing goods. I cannot understand why we do not get our boxes as well filled as the Americans, for they send them in from hundreds and thousands of miles and they are jammed full, crushed right down on top, yet the last few days we got our berries in here slack filled and they are down a cent after we buy them.

MR. EDWIN SMITH: What is the most desirable package for peaches?

MR. CLARK: Some people want six quarts and some eleven quarts. We find the American boxes of peaches that come in carry better than our baskets do. They are not bruised so easily. I think the six or eleven quart baskets are a nice thing to ship in.

THE PRESIDENT: I think great good would come from a conference. I think it could be shown that our berries would not stand being crushed. On the other hand when a crate is filled at the top and not at the bottom, there should be criminal prosecution.

Mr. Clark said that American boxes of fruit carry better, but I did not hear him say they sell better. The trade in Toronto does not encourage the packing of peaches in boxes, because very often if they were sent here they would get the same price for 20 pounds that you would get for 15 or 16 pounds in a basket.

MR. CLARK: I did not recommend the box; I think the baskets are the best for display and for selling the goods. The goods well displayed are half sold.

YIELDS OF APPLE TREES AT DIFFERENT AGES.

W. T. MACOUN, DOMINION HORTICULTURIST, OTTAWA.

This paper is written merely to point out to fruit growers that very few of them keep records of what their trees yield from year to year and it is hoped that a discussion of the paper may lead a number of fruit growers to keep records themselves.

Each year there is a large number of new fruit growers in the Province of Ontario, men who believe that they can make a success of the industry and who are determined to try. These men, before making their decision, estimate present and future expenses; they also endeavor to estimate probable crops and profits, but when they come to look for figures showing the yields of different varieties of apples they are disappointed. It is a remarkable fact that there has been very little reliable information published in America on the actual crops obtained from trees of different ages of the varieties of apples which are usually planted for commercial purposes. There is the general statement that Wealthy and Wagener are early bearers, that Northern Spy does not bear anything to speak of until it is about twelve years of age, that King is a very shy bearer, that McIntosh is a rather light cropper in some places, and so on, but few actual figures are available. In fact until a table of such yields was published in the Annual Report of the Experimental Farms for 1902 we do not think that any records of yields had been published when trees came into bearing and afterwards. Other records have been published in the reports for 1903, 1905, 1905-6, 1909, and 1911.

Since the year 1898 or for sixteen consecutive years records have been kept of over 3,000 apple trees in the orchards at the Central Experimental Farm. Unfortunately, among these trees the winter varieties of most commercial value in



A mature Spy tree before pruning.

Western Ontario are not to be found, such varieties for instance as King, Greening, Baldwin and Spy, as they have not proved hardy at Ottawa, but other well known sorts such as Yellow Transparent, Duchess, Wealthy, Fameuse, and McIntosh have been recorded with many others. The number of trees of each variety grown at Ottawa, however, is very limited, as so many sorts are under test. In the table which has been prepared only the heaviest yields are given, as it is believed that where only a few trees of each variety are grown the highest yielding tree would be fairly near the average of an orchard of several acres. These figures are not given for the main purpose of basing future profits in orcharding, but rather to give some idea of about the crop one might expect from trees of different ages. For estimating probable profits the yields from whole orchards should be taken for a series of years, but while, no doubt, many such figures will be available in a few years, few have been published yet except those in connection with demonstration orchards where mature trees are under test.

It has been found that the McIntosh apple comes into bearing the sixth year after planting at Ottawa. In that year a tree has borne about two eleven quart baskets of fruit, and by the eighth year nearly a barrel of fruit is borne on a tree. By the tenth year a barrel and a half, by the twelfth year three barrels; the fifteenth year, four and a half barrels; the nineteenth year seven and a half barrels; the twenty-first year, seven barrels; the twenty-third year, six barrels, and the twenty-fourth year and the year following four and three-quarter barrels or an average during the past two years of nearly five and a half barrels a year. Taking the average per year for nineteen years during which it has been in bearing, we find the average yield per year from one tree has been about two and three-quarter barrels. It would look as if one might safely count on two barrels a tree.

The Duchess apple is one of the most reliable and productive varieties. It begins bearing the third year after planting and by the sixth year the trees will bear nearly a barrel apiece. By the eighth year two barrels, and by the tenth year three barrels; by the eleventh year more than four barrels, and the maximum crop so far has been reached in the twenty-fourth year, when a yield of over eight barrels was obtained from one tree. One tree bore the following crops in thirteen consecutive years beginning with the 11th year: $2\frac{1}{2}$ barrels, 2, $3\frac{3}{4}$, 3, $4\frac{1}{2}$, 3, 4, 2, $4\frac{1}{2}$, 4, 6, 2, $5\frac{1}{2}$. Other trees bear a heavy crop every other year. The average yield per tree from the third year to the twenty-sixth is about two barrels per tree, and from the tenth year to the twenty-sixth, three barrels.

The Wealthy is one of the earliest and most productive bearers, but it does not become a large tree, and the maximum crops have not been as large as some other varieties. It begins bearing the second or third year after planting. One tree gave us as much as nine gallons of fruit the third year, but as a rule there are only a few apples the second and third years, and most trees do not give more than from three to five gallons the fourth year. The fifth year there is about half a barrel to a tree, although we have had over a barrel on one tree. By the seventh year the trees will be bearing a barrel or over, and by the eighth year there has been as high as two barrels on a tree. By the eleventh year some trees will bear two and a half barrels, and by the thirteenth and fourteenth year from three to four barrels. The highest yield obtained from a Wealthy in one year was $5\frac{3}{4}$ barrels in the twenty-fourth year. The average yield per year from the third to the twenty-sixth year is about a barrel and a half. This is a low average compared with some other varieties, but the Wealthy is a small tree, and as a rule bears heavily one year and has a light crop the next which brings down the average.

YIELD OF FRUIT, IN GALLONS, PER TREE, YEARLY, FROM DATE OF PLANTING

Variety.	Date of Planting.	3rd year.	4th year.	5th year.	6th year.	7th year.	8th year.	9th year.	10th year.	11th year.	12th year.	13th year.	14th year.	15th year.	16th year.	17th year.	18th year.	19th year.	20th year.	21st year.	22nd year.	23rd year.	24th year.	25th year.	26th year.	Total.
Yellow Transparent .	1890	...	...	...	...	...	*27	1	17½	0	59	1	97	25	109	10½	100	0	91	...	...	...	...	...	...	...
"	1897	...	...	...	6	14	26	5	46½	0	42	6	82	16	100	...	...	...	...	...	...	...	...	...	...	...
Duchess of Oldenburgh	1888	...	...	...	...	...	...	...	*32	22½	66	1	63½	47	89	54	143	0	126	1	131	0	175	1½	169	1,139
"	1888	...	...	...	...	...	...	...	*32	42½	42½	1	63½	47	89	70	111½	68	100	52½	111½	93	149	49	132	1,201½
"	1897	...	...	...	18½	9	...	0	79½	0	78	0	109½	107	107	0	96½	1½	75	5	118	15½	129	0	119	451
Wealthy .	1888	...	...	...	12½	1½	...	...	*21	51	32	52	42	55	61	22	96½	...	...	...	...	...	...	...	...	872½
"	1896	...	...	...	...	...	...	...	*33	21	35	28½	...	...	...	...	...	...	...	...	...	...	...	...	...	497½
Fameuse	1888	...	...	...	...	...	...	...	*21	51	32	52	42	55	61	22	96½	...	...	...	...	...	...	...	...	609½
"	1897	...	...	...	1	16½	...	...	*33	21	35	28½	...	...	...	...	...	...	...	...	...	...	...	...	...	351
McIntosh	1890	...	...	...	...	...	*17½	26	37	64	71	94	12	109	3	109	41½	184	50	166	55	145	112	...	...	1,239
"	1893	...	...	...	...	...	*17½	26	37	64	71	94	12	109	3	109	41½	184	50	166	55	145	112	...	...	433
Milwaukee	1895	...	...	...	4½	0	19	24	19	16½	51	28	96	24	79½	80	...	...	...	...	...	...	...	...	...	473
Baxter	1889	...	...	...	5	19	25	12	50	1	56	43½	62	18	55	55½	62	36	50	20	30	24	24	6	...	433½
Lowland Raspberry	1888	...	...	...	...	...	...	...	*14½	0	1	14	15½	30	19	11½	7½	74½	14	91	13½	123	14	78½	15	576½
"	1892	...	...	...	...	...	...	...	*14½	0	1	14	15½	30	19	11½	7½	74½	14	91	13½	123	14	78½	15	199½
Langford Beauty	1897	...	...	...	1½	1½	24	3	0	17	25	61	1	25½	11	13½	...	...	...	...	...	...	...	...	...	190
McMahan	1888	...	...	...	...	...	...	...	*62	0	83	2	147	43	72	96	75	52	81	78	97	94	50	72	143	1,235
"	1888	...	...	...	...	...	...	...	*25	44	46	1	69½	43	72	96	75	52	81	78	97	94	50	72	143	1,098½
Peach of Montreal	1888	...	...	...	...	...	...	...	*12	27½	32	36½	71	47	61	82	58	54	38	55	27	82	54	75	59	860½
Canada Baldwin	1888	...	...	...	...	...	...	...	*8	40½	10½	22½	29	30	17	70	17	54	11	46	27	54	16	12½	18	427
Antonovka	1888	...	...	...	...	...	...	...	*3	0	9½	2	57	7	88	68	105	84½	84	77	112	65	113	0	152	1,027
"	1888	...	...	...	...	...	...	...	*0	2½	12½	10	47	22	67	40	69	15	110	33	87	10	120	13	129	787
"	1888	...	...	...	...	...	...	...	*2½	0	14	9	15	44	12½	70	0	73	2	109	0	169	0	129	0	649
"	1897	...	...	...	2½	18	33	41	55	9½	50	10	60½	58	0	59	...	...	...	...	...	...	...	...	...	356½
Hibernal	1888	...	...	...	...	...	...	...	*19	0	74	0	60½	58	0	59	...	...	...	...	...	...	...	...	...	962½
"	1888	...	...	...	...	...	...	...	*19	0	74	0	60½	58	0	59	...	...	...	...	...	...	...	...	...	624
Charlamoff	1888	...	...	...	...	...	...	...	*20	4½	32	6½	66	6	106½	33	81	33	103	38	97½	15	108½	25	133	908½
"	1897	...	...	...	...	...	...	...	*20	4½	32	6½	66	6	106½	33	81	33	103	38	97½	15	108½	25	133	387
Dudley	1891	...	...	...	7	12½	40	2	86	0	73	0	66½	6	106½	33	81	33	103	38	97½	15	108½	25	133	744
Patten	1891	...	...	...	...	...	...	...	39	39	39	88	64	48	48	48	48	48	48	48	48	48	48	48	48	974½
Bethel	1890	...	...	...	...	...	...	...	15	15	15	34	34	34	34	34	34	34	34	34	34	34	34	34	34	384½
"	1890	...	...	...	...	...	...	...	15	15	15	34	34	34	34	34	34	34	34	34	34	34	34	34	34	384½
Anis	1895	...	...	...	...	...	...	...	11	0	22	34	18	44	24	36	44	38	55	20½	92	29	28	20	...	249
"	1888	...	...	...	...	...	...	...	8½	0	13½	8½	76	12½	86	70	83	62	119	35½	142	0	132	8	166	1,022½
"	1890	...	...	...	...	...	...	...	5	3½	62½	10½	69	74	65	60½	92	49	135	0	67	23	159	...	...	887½
"	1890	...	...	...	...	...	...	...	6	1½	67½	16½	80	106	80	146	0	155	133½	1	133½	0	53	122	...	896½
Anisim	1888	...	...	...	...	...	...	...	*0	...	5½	4	42	37	16	88	8	110	1½	130	52	153	0	75	30	752½

* Record previous to 1898 not kept.

But from the twentieth to the twenty-sixth year the average is two and three-quarter barrels a tree.

Other varieties could be discussed in the same way, but the records of them will be found in the table which will be published. One of the highest yields obtained from any one tree in any one year was from a McMahan which, in the twenty-sixth, which is the greatest age of trees in our orchards, yielded nine barrels.

In Bulletin No. 376 of the New York Agricultural Experiment Station the yields are given of an acre of Baldwin orchard of trees twenty-seven years old at the beginning of the experiment and thirty-seven years at the end. For ten years the average yield per tree was 4.29 barrels consisting of 2.91 barrels stock and 1.38 culls and drops. These are the only figures outside of our own for a long period of years that I have been able to find.

The figures which I have given in this short paper are merely suggestive as has been stated before. What are needed are figures for a considerable number of years from large orchards of a few varieties, and it is to be hoped that the Provincial demonstration orchards throughout the Province will later on publish this information.

PROF. MACOUN: Since I came to this meeting Prof. Crow has put in a statement prepared by one of his students giving figures for three years. I hope it will be possible to publish that table with the proceedings in connection with this paper, because it would add some more figures for the information of those men who have been looking for them.

PROF. CROW: Referring to the figures mentioned by Mr. Macoun, they were collected in Norfolk County and give the average yield per tree for the years 1911, 1912, 1913 as follows: 1,329 Baldwins, 1,124 Spies, 1,077 Greenings. The trees were of bearing age, that is possibly about twenty-five years, and all under uniform conditions of ordinary good care; the inferior trees or orchards, not well cared for, have not been included in this estimate. The average yield per tree was: Baldwins, 2.41 barrels; Spies, 2.35 barrels; Greenings, 2.03. I have additional figures of other varieties, but in each case the number of trees are not sufficiently large to give us the average yields, therefore, it is better to say nothing about them. As to these three varieties, I feel that we have a fairly accurate record of the way these trees perform in an orchard under average conditions for a period of three years—the total yield of packed apples not including culls; Nos. 1 and 2 are lumped together here and that might make somewhat of a difference.

MR. BUNTING: Would you call it two years of comparatively light bearing and one of heavy bearing, or two of heavy bearing and one of light as far as those orchards are concerned?

PROF. CROW: The average yield of Baldwins in 1911 was 2.84; of Spies, 2.63; in 1912, Baldwins, 2.68; Spies, 2.33; in 1913, Baldwins, 1.85; Spies, 2.14.



The same Spy tree as on page 69, after pruning. Note that considerable of the top of the tree has been removed in addition to thinning out the lower branches.

CO-OPERATIVE EXPERIMENTS.

PROF. J. W. CROW, O.A.C., GUELPH.

Regarding the co-operative experiments there was a movement started last spring from Guelph to carry on experimental work in certain phases of fruit growing. The movement grew out of discussions which took place in the meetings at Vineland of the Board of Control of the Experimental Station. My idea is that there is a great deal of work which can be done better in a co-operative way working with the fruit growers on their own farms than on the Government farm in one place even under the best of management. I am perfectly convinced of that. I have studied the experimental work in fruit growing for a long time, and I would like to have 500 or more acres on which to conduct experiments which would settle, for instance, this matter of the sale of stocks for fruit trees and methods of propagation and culture. My conclusion is that the sort of thing to be worked along on a large enough scale to make it adequate is impracticable; it can only be done by the fruit growers. Last year we started three experiments in top grafting to find out whether we can successfully change Ben Davis to Northern Spies and McIntoshes, and we used some Snows, and we hope to extend that top grafting work next year. This year we started experiments in the matter of summer pruning to see if it would be possible to hasten the fruit bearing of the Northern Spy. We are working with that variety particularly, because it is of such great importance to bring the Northern Spy into fruit bearing at an early date. We have a number of experiments started on that point and we are hopeful that we shall be able to obtain results. Ordinarily growers have to wait fifteen or seventeen years to get fruit out of that variety. That is too long. It eats up the profit. The other experiments are along the same line. One important point which we have come up against this present year is the proper stocks for fruit trees. This will not be easy to work out as it involves the procuring of various stocks which are not at present handled by nurserymen; propagating trees on them and sending those trees out to certain commercial plantations, then following those for a number of years until we can see the result. In our work this year we have been called upon to investigate a large number of cases of what proves to be winter injury to trees. Strange to say we find more of that south in the Province than we do north, for the simple reason that in localities which have abundant snowfall there is comparatively little root killing. The form of winter killing we have come in touch with this year is root killing. We have put a good deal of time on that, and my conclusion is that the stocks which nurserymen are using at present—I mean the roots on which they bud our trees, apples, pears, and cherries—are not sufficiently hardy for this Province. Hundreds and thousands of trees are dead and dying at present in Ontario as a result of root killing which took place last winter and the winter before and even the winter before that. For the last three years we have had a good deal of it. It does not manifest itself in the same way; that is one of the problems that must be considered. We are hoping to overtake that by procuring from whatever source we can the hardiest stocks, and of course it will take sometime to grow the stock before we can put it out to the fruit growers.

In the matter of top grafting and summer pruning, and in matters having to do with the use of cover crops and fertilizers and different methods of tillage,

I simply wish to state that if any fruit grower would like to work with us in testing out any of those points, we should be very glad indeed to work with him. We want to get in touch with careful men who will follow up matters intelligently, and of course follow instructions which we hope will always be reasonable and correct. By working in harmony with the growers, we shall be able to arrive at more really definite conclusions on matters which at present are problematical.

PROTECTION AGAINST FROST BY THE USE OF FIRE POTS.

M. B. DAVIS, B.S.A., OTTAWA.

The question of protection against late spring frosts is one that has had the attention of nearly every grower of fruits and vegetables which are subject to its ravages.

Of the various methods devised only one seems worthy of consideration and that is the method of raising the temperature of the surrounding air by the use of orchard heaters or fire pots.

TYPE OF HEATER USED.

Although there are many types of heaters on the market, only one was used at the Central Farm owing to the inability of several manufacturers to supply their heaters at short notice. The type used is known as the competition heater and is one of the simplest forms on the market. It has the great advantage of being able to be stored in a comparatively small space, and furthermore there is no mechanical device to get out of order. The heater in question consists of an ordinary pail of sheet iron with perforations around the top to allow of a draught of air; there is also a perforated rim which fits into the heater to assist in this draught. The heaters are supplied with a cover to be used during bad weather.

FUEL.

The fuel used in these heaters is what is known as fuel oil and can be procured from any of the leading oil companies of Canada. It has a specific gravity of about .85 and a flashing point of 275. In tank car lots it may be purchased at six cents per gallon or less, f.o.b. Ottawa and in barrel lots at eleven cents f.o.b.

NUMBER OF HEATERS PER ACRE.

The number of heaters required per acre will depend upon the degree of frost to combat. For ordinary purposes 100 heaters per acre should be ample, as this number of heaters is sufficient to raise the temperature of the surrounding air 8 degrees on the worst night and 10 degrees on the average frosty night, a great deal depending upon the wind.

METHOD OF DISTRIBUTING THE HEATERS.

The method of distributing the heaters throughout the area to be heated will depend on the quarter from which the wind is blowing. Generally on our frosty nights the wind comes from between the north and west, so that in this case there

should be more heaters on the north and west sides than on the other sides. It will be readily understood why this is done, as the wind could blow the heat over the rest of the area. If on the other hand the wind was from the east and the larger number of heaters were on the west side of the area the heat would be driven from the western side to a point outside of the area to be heated. It is not a very large task to shift the pots just before lighting to suit the night in question, but it is very important to have the larger number of pots well to the windward of the area requiring heating.

The pots should be filled and placed in the field some time before frost is expected so that everything will be in readiness at a moment's notice. As a good strong cover is supplied with each heater there will be no danger of rain getting in to dilute the oil, if the heaters are kept covered while not in use.

LIGHTING AND CARE OF HEATERS WHILE IN USE.

As the oil used in these heaters is very crude and unrefined it has a very high flashing point, or, in other words, will not ignite readily. Hence it is necessary to employ some other means of lighting the pots than by merely applying a lighted match or torch. If gasoline, which is a very combustible product, is applied to the surface of the liquid in the heaters, and a lighted match or torch is then applied, the gasoline will ignite and burn and by the time it has burned out it will have raised the temperature of the oil to its flashing point and ignition will take place. In experimenting at this station it has been found that only a few drops of gasoline are necessary for this purpose; two quarts is ample for one acre or one hundred heaters. In lighting up, the method employed is somewhat as follows: First, have all the covers removed from the heaters, which will only take a few minutes. After the covers have been removed one man starts with a bottle of gasoline and drops a few drops of the gasoline in the heaters. He is immediately followed by a man with a lighted torch who applies the torch to the surface of the pot. In this manner the task of lighting is carried out very quickly. One thing to remember is, do not apply the gasoline until just before ready to light, for it is so volatile that the small amount used will readily evaporate from the comparatively large surface. The torches used may be made out of any stick with bagging wrapped around and tied with wire, then soaked in gasoline, or kerosene. Another point worthy of mention is that kerosene or coal oil will not take the place of the gasoline in lighting up, as kerosene will not light quickly and is consequently of no use for that purpose.

REFILLING.

Whether or not the heaters require to be refilled while a frost is in duration will depend upon the length of the frost period. The heaters hold six imperial quarts and will burn anywhere from six to nine hours. Ordinarily this is ample to carry a crop through the worst night we would expect in spring, as at that time of year frosts only last about four hours. If, however, it becomes necessary to refill, it can be safely carried out without extinguishing the flame. The oil is of such non-combustible nature that it will not explode or cause any harm to the operator when poured into a burning heater. At first there will be a sputtering, due to the cold oil coming in contact with the hot pot, but if a large snouted can is used no danger need be anticipated. It is not advisable, however, to apply the oil from an ordinary bucket, for in this operation the operator may have to put

his face too close to the heater and thus may receive burns from the hot sputtering oil. Allowance should always be made for refilling, and barrels of oil should be distributed throughout the area to be heated so as to facilitate the operation of refilling as much as possible. With the oil distributed in barrels at different points, two men can, with a ten-quart long-snouted can, care for from two to three hundred heaters on the worst night and keep same properly filled.

EXTINGUISHING.

The fire or flame in the heaters may readily be extinguished by simply placing the cover on the heater. The flame may smoulder for a few minutes but will soon be extinguished as soon as the cover is placed in position.

SOME RESULTS FROM USING FIRE POTS.

As no frosts were experienced in the late spring it was decided to test out these orchard heaters in the early fall. On the night of September 28th the heaters were lighter for the second time. On this night the frost came very early and the thermometer had fallen to 32 degrees before there was any person in the vicinity to give the alarm, as all the men were home to their suppers. The heaters were lighted, however, at 8.35, and at this time the temperature was 30 degrees F. on the ground and 32 degrees F. fourteen inches above the ground. It might be added that thermometers were placed both inside and outside of the heated area. These thermometers were placed one on the ground and the other fourteen inches above the ground, four thermometers being used for the two areas. These had all been previously tested and corrected. The thermometers inside the heated area were placed as far from any of the heaters as it was possible to place them. Readings both inside and out were taken at different intervals throughout the night, and the results are recorded below. Besides depending on the thermometers, young tomato plants from the greenhouse were placed, some inside and some outside, the heated area. Next day it was observed that those plants which had been inside the heated area were not injured at all, while those plants which had been outside were entirely killed by frost. As before stated, the heaters were lighted at 8.35 when the ground temperature was 30 F. and the temperature fourteen inches above the ground was 32 F. At 9.05, just half an hour after lighting, the temperature inside the heated area had risen to 32 F. on the ground and 34 F., fourteen inches above the ground, while the temperature outside was 28 F. on the ground and 30 F. fourteen inches above the ground. This shows a rise of 4 degrees in temperature in one-half hour due to the effect of the heaters.

The following table gives the temperatures both inside and outside the heated area at different hours during the night:

	9.05 p.m.		10.30 p.m.		1.30 a.m.		3.00 a.m.		5.45 a.m.	
	Ground	14"	Gr. & 14"		Gr. & 14"		Gr. & 14"		Gr. & 14"	
	Ground	14"	Gr. & 14"		Gr. & 14"		Gr. & 14"		Gr. & 14"	
Heated area	32	34	33	36	32	34	31	34	32	34
Outside area	28	30	32	34	28	30	24	28	26	29

It will be noted that until 1.30 a.m. the heated area had a minimum temperature of 32 degrees F. against a minimum temperature of 28 degrees F. for the outside area. After 1.30, of course, the temperature on the ground inside the heated area dropped to 31 degrees F., or 1 degree below frost, but it must be remembered that this was some 7 degrees higher than outside the heated area and

that such a frost at this rarely occurs, if ever, during the spring. It is also well to note that at 14 inches above the ground the minimum temperature inside the heated area was 34 degrees F. as against 28 degree F. for the unheated area. This record, coupled with the fact that the tomatoes in the heated area came through uninjured is fairly good evidence that the heaters are a practical method of fighting frost.

Cost.

Whether or not it is an economical method will depend to a very large extent on the margin of profit of the crop in question, although it must be borne in mind that a frost may mean the difference between absolute failure and success, and even if the cost of saving the crop eats up the profit, the loss may not be as great as it otherwise would be had it been allowed to be totally destroyed by frost.

The following estimate of plant and operating expenses seems fair:

Cost of 100 heaters at 31cents	\$31 00
One frost alarm thermometer	30 00
Total for plant	\$61 00
Operating expenses per acre:—	
Placing and filling 100 heaters	\$1 25
Tending to 100 heaters, 5 hrs., 2 men at 20 cents.....	2 00
Fuel, (maximum consumption, see below)	12 50
Gasoline for lighting	0 20
Cost per acre	\$15 95

NOTE.—The amount of fuel used may vary from four quarts per 4½ hours to four quarts per seven hours, or in cost from \$1.60 to \$2.50 per acre per hour, depending on the night in question. The frost alarm will also serve for any number of acres, so the cost of plant per acre would gradually be reduced.

A FROST ALARM SYSTEM.

Many nights during early spring threaten frosts, which do not actually arrive, or if they do, only come in local areas, and are very difficult for any person to foretell whether a frost will actually come or not, so that the only way to be on the safe side would be for the grower to sit up and keep watch. As this is a very arduous task, it is quite essential that a frost-fighting equipment be supplemented by the addition of a frost alarm. The frost alarm thermometers are very accurate, and are very simple in construction. The working is very simple. The thermometer is placed on a post a distance of about six or eight inches from the ground and the battery box and bell are placed in the caretaker's bedroom. The thermometer should be placed in a cold part of the farm where frosts generally strike, and it should not be more than 900 feet from the battery box. The two wires are then led from the battery to the thermometer.

The alarm thermometer is a specially made instrument, with a fine platinum wire fused into the bore of the tube connecting with the mercury column at 32 degrees F. or any other one permanent point desired. A second wire, touching the mercury at a point below the other, completes a circuit which is broken the instant the mercury drops below the designated danger point,—the permanent point referred to above. A non-sparking special relay battery attachment causes a bell to ring at practically any distance from the thermometer itself the moment the circuit is broken. Until the alarm rings the danger is not imminent, and all unnecessary expense may be spared.

REPORT OF THE HISTORICAL COMMITTEE.

A. W. PEART AND W. T. MACOUN.

The story of the growth of the Ontario Fruit Growers' Association is so interwoven with the evolution of the fruit industry of the Province, that the history of the one involves and implies that of the other.

In this report the purpose of your Committee is to give only a synopsis of a very general character of a few of the outstanding events which made for the betterment of the industry, and marked the solid progress of the Association.

Over half a century ago the leading fruit growers felt that the lack of a central organization for mutual usefulness was a serious handicap, and on the 19th day of July, 1859, they met in the City of Hamilton and organized the Association.

The Fiftieth Anniversary of the Society was held in Toronto, in 1909, and fittingly celebrated.

The beginnings of co-operation in handling and shipping apples in car lots were found at Belleville and Burlington around the year 1881.

About the year 1898 co-operation in shipping was organized by the St. Catharines and Chatham Associations.

Previous to these, however, if we mistake not, other local societies in the Niagara District such as Winona and Grimsby united for selling their fruits to better advantage in the various markets of the Province, by appointing salesmen and distributing their products to better advantage.

At Leamington in 1903, co-operation was a leading feature of the programme, and in the following year at Toronto, a Standing Committee was appointed by the Association to organize co-operative societies wherever desired by local growers. So effective was this work that in 1908 there were some thirty-five organizations in the Province. At the present time there are at least fifty-seven such societies. All are doing effective, economic work for their members.

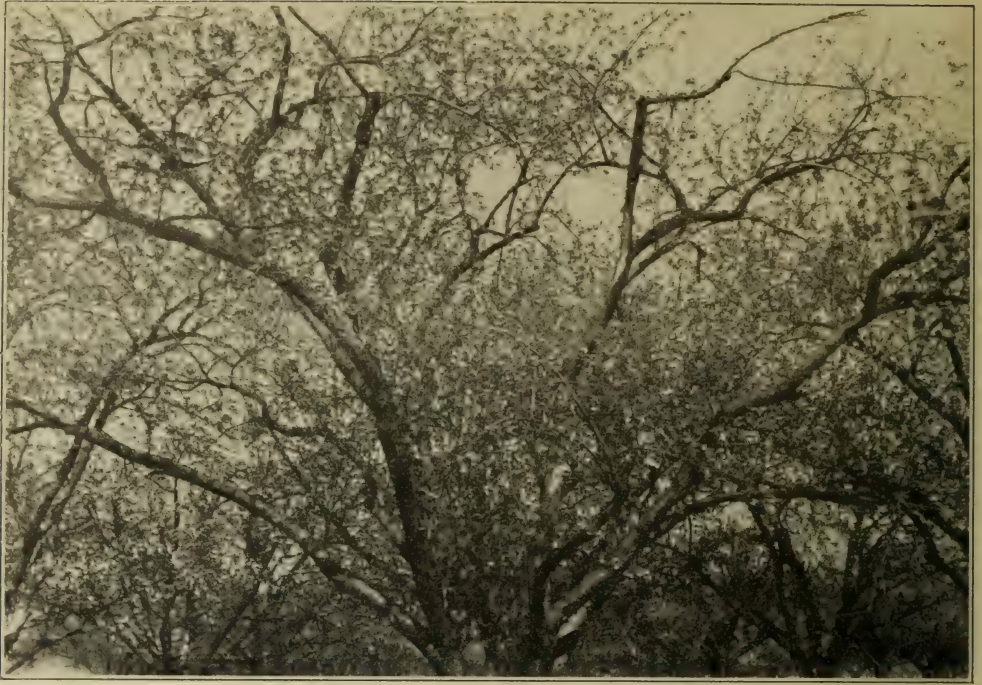
During 1885-1889 local fruit interests began to organize and affiliate with the Ontario Fruit Growers' Association, and from then on to the present the societies have increased rapidly, now numbering about sixty-five.

In 1889 some leading growers discouraged by the ravages of the codling moth bought spray pumps, and used paris green and water as a spray. This was more or less effective, but the difficulties were such that few had the courage to go on.

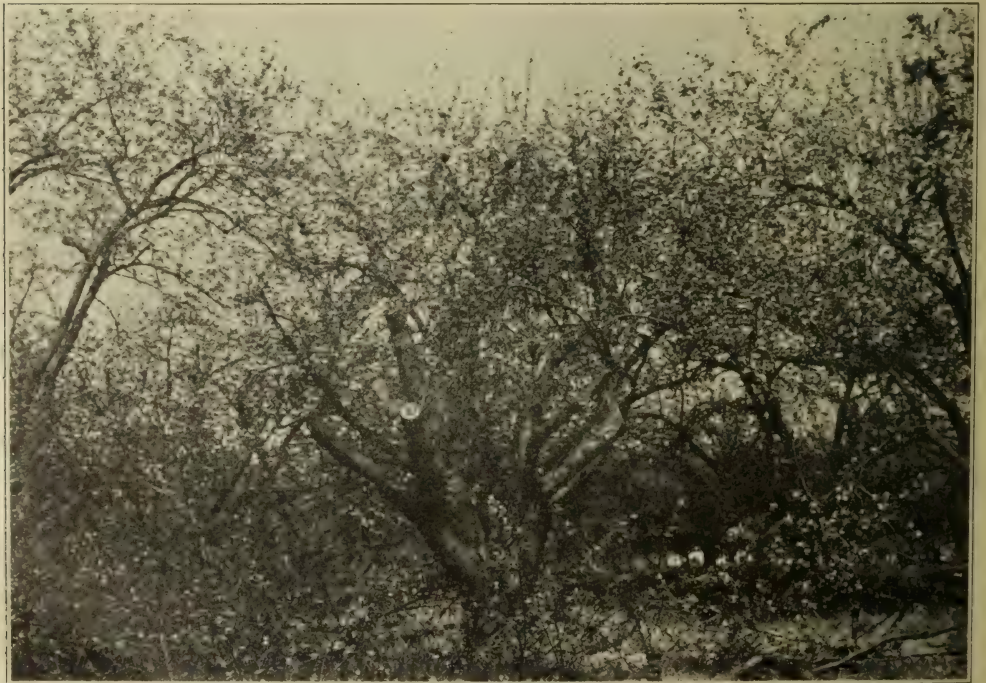
In 1895 the Department of Agriculture began to give demonstrations in spraying in various parts of the Province. These served a good purpose inasmuch as they stimulated the growers to be more thorough in spraying their orchards.

Up to 1908, however, there was very general scepticism as to the advantage of spraying for the codling moth. During that year the Central Association took a firm grip of the problem, and by showing what practical growers had done, how they did it, and the results they got, gave spraying a definite place in the routine of successful fruit growing.

In Hamilton, on June 19th, 1897, a mass meeting of growers was held to determine the best means to fight the San José Scale, which had appeared in some districts. It was decided to secure Governmental aid and wage a vigorous



An Apple Tree becoming unproductive through canker and old age. The illustration below shows the same tree after "beheading."



A "Beheaded" Apple Tree. One way of rejuvenating trees that have become unproductive from some cause or other.

campaign against this dreaded scourge. After much investigation, experiment and labor, the scale was finally brought under control, lime-sulphur and soda-sulphur being found effective remedies.

Fruit experimental stations were organized at various points in 1894. These did a good work in trying out varieties of fruits suitable to a given district, and were especially useful to young men, and those just starting into the fruit business, but lacking in experience. Having served their purpose during an existence of twelve to fourteen years most of them have been abolished.

In 1904 the Ontario Association settled permanently in Toronto; previous to this time the meetings were held at various centres in the Province, in order to encourage a wide range of production where conditions were suitable, and the formation of local societies. These objects having been accomplished, it was felt that the time had come to settle permanently in Toronto, convenient to all parts of the Province, and in official touch with the Department of Agriculture.

While fruits, especially the newer varieties, were always shown at the annual meetings of the Association, and served a useful educative purpose, in 1904 it was considered that the fruit industry had reached such proportions that a fruit show could be successfully organized, especially if in connection with the flower and honey industries.

Arrangements to this end were made, and in November, 1904, a fine display of fruits, flowers and honey was placed at Massey Hall.

This show has been an annual event ever since, waxing stronger and stronger, until it became one of the best on the continent, especially in regard to the quality of products.

TABLE SHOWING INCREASES AND DECREASES IN FRUIT PRODUCTION, IN THE PROVINCE OF ONTARIO.

(Taken from Census Reports.)

Fruit.	Quantity.	1871.	1881.	1891.	1901.	1911.
Apples	Bushels	5,486,509	11,400,517	5,043,612	13,631,264	6,305,462
Peaches .....	"	.....	.....	40,626	539,482	503,075
Pears .....	"	.....	.....	208,887	487,759	417,397
Plums .....	"	.....	.....	171,335	337,108	331,278
Cherries .....	"	.....	.....	106,658	132,177	137,281
Other fruits ...	"	242,878	644,707	208,415	40,108	33,181
Grapes	Pounds	1,028,431	3,697,555	11,725,281	23,156,478	36,615,877
Small fruits ...	Quarts	.....	.....	.....	16,232,020	18,249,707

Estimated capital invested in the fruit industry of the Province of Ontario, \$80,000,000.

It should not be inferred from the 1911 record as shown above that the fruit industry is on the wane in the Province of Ontario.

The census taken in 1911 was based on the crop of 1910, and it so happened that orchard fruits were a short crop that year.

The same census shows the following increase in acreage in this Province in 1911 over 1901:

Orchard and nursery	4,554 acres more.
Vineyard	3,629 acres more.
Small fruits	13,940 acres more.

1914 is an abnormal year from whatever angle you may view it. Early in the season a wave of depression swept over the country succeeding a period of general prosperity. The fruit industry, in common with many others, began to suffer, noticeably in regard to the cherry crop. For the first time in fifteen years the fruit at one stage of its marketing did not return to the grower the cost of handling.

This was previous to the great war in Europe. After that volcano burst the grower began to direct his best energies towards the disposition of his apples, and from that time on he has had an uphill fight. Between the trade depression, the heavy crop and the war, prices have been cut in two, and it is still a problem whether he will come out even. The Department of Trade and Commerce helped the situation in a measure by inaugurating a broad advertising campaign, calculated to direct the attention of Canadians to the high quality and general merits of our apples, and thus broaden the home demand for our best fruit.

A meeting of the Dominion fruit growers was held at Grimsby, early in September. A full complement of delegates was present from all the Provinces, and under the generalship of Mr. D. Johnson, our new and capable Fruit Commissioner, a pleasant and profitable time was spent.

We regret to have to chronicle the absence of the Fruit, Flower and Honey Show this year, but venture to hope that when the war clouds roll by it will re-appear with new and increased vigor.

Upwards of 2,300 boxes of apples were promised by various associations for this year's exhibition when it had to be cancelled. This is considerably more than last year.

It is pleasant to record that the fruit growers of the Province have arisen to the call of the Mother Country for help in her hour of need. Many of them have enlisted and gone to the front, others again have contributed liberally of their means and substance in donating carloads of apples to the soldiers and stricken Belgians, and otherwise relieving distress; while all are devoting their best ability to increasing the productiveness of their crops, being convinced that in the final issue the fate of empires will be largely determined by the supply of food available.

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS AND SECRETARY'S REPORT.

This Committee beg to report that we are thoroughly in accord with the President's suggestion which was greatly emphasized in Mr. Johnson's admirable address, that in coming years very much greater attention should be paid to a well considered and fully organized campaign looking to this better distribution of the large quantities of fruits which are now being produced by the fruit growers of this Province, and would recommend that the officers of this Association be charged with the duty of assisting the members generally in this laudable object.

That while the Fruit Exhibition which has in the past few years grown to such large proportions, was unavoidably cancelled for this year, steps be taken in ample time to arrange for a still more successful exhibition next year than any that have heretofore been held.

That the statement of the Acting Secretary, that a large number of local associations throughout the Province are not affiliated with nor officially repre-

sented by the Ontario Fruit Growers' Association, is a matter of regret, and that steps be taken to remedy this condition. And to this end that the Director of each division be requested to take a census of the local fruit growers' organizations in his district, visit these associations, and urge those not at present affiliated with the Provincial Association to become connected under the liberal terms at present offered and thus strengthen both themselves and the Provincial Association by their active co-operation and assistance.

That this Committee express their hearty satisfaction with the continued interest taken by the Minister of Agriculture the Hon. Mr. Duff in the activities of this Association both personally and in a financial way.

RESOLUTIONS.

The following resolutions were submitted, discussed and carried:

1. **RESOLVED**, that this Association place on record its appreciation of the great service rendered to the Horticulture of this Province by the late Dr. William Saunders. We feel, too, that the personal memories left with us are no small part of the valuable legacy left by our esteemed friend. The beginning of Dr. Saunders' work for horticulture dates back beyond the memory of most of our members, but his later work is still fresh in our minds. It is not too much to say that this Association has for many years back been reaping the result of his labors, and that we shall continue to do so for many years to come; and resolved further that a copy of this resolution be sent to the widow of the late Dr. Saunders.

2. **RESOLVED**, that the Ontario Fruit Growers' Association place on record its deep sense of the loss sustained in the removal of our old friend, colleague and leader, the late Alexander McNeil. We of this Association retain many vivid memories of the never failing courtesy, sympathy, and wise counsel which were so characteristic of him. His singleness of purpose and his high mindedness are inseparable in our thoughts from the man himself, and we feel that his influence and memory merit unqualified recognition at this time.

3. **RESOLVED**, that this Association desires to express their appreciation of the enterprise of Sir George E. Foster, Minister of Trade and Commerce, in advertising throughout Canada the merits of the Canadian apple, with a view to its increased home consumption.

That in the opinion of this Association the campaign has increased the domestic consumption of Canadian apples, and that the Department be asked to continue the campaign next year.

4. **RESOLVED**, that in the interest of apple growers and shippers the Fruit Division at Ottawa be asked to make such regulations as will permit the use of a half box for export purposes of the same length and width as the standard apple box, but 5 inches in depth.

5. **RESOLVED**, that we heartily endorse the appointment of Mr. D. Johnson to the Fruit Commissionership of Canada, and congratulate the Hon. Martin Burrill on his selection.

6. **RESOLVED**, that this Association desires to thank Mr. Ruddick for his valuable services in the past as the head of the Fruit Department at Ottawa.

7. **RESOLVED**, that the staff of fruit inspectors be strengthened so that the fruit growers may have their fruit inspected at point of shipment upon applica-

tion during the packing season, and that upon request the inspectors issue a certificate stating the results of their inspection so far as it has gone.

That a copy of this resolution be forwarded to the Hon. Minister of Agriculture for the Dominion.

8. **RESOLVED**, that the present acreage of trees planted now and coming into bearing will necessitate the further extending of our markets and that our Association impress upon the Federal Government the absolute necessity of extending the power and scope of the Dominion Railway Commission to cover the operations of the transportation agencies doing business in Canada.

9. **RESOLVED**, that the present system of production and distribution of nursery stock should receive some attention and some legislation enacted to safeguard the growers of fruit from either careless or unscrupulous growers or distributors of nursery stock.

10. **RESOLVED**, that this Association place on record its appreciation of the work, in its interests, of the late Linus Woolverton, who for many years was the Secretary of the Ontario Fruit Growers' Association, and a prominent fruit grower in the Province. Mr. Woolverton, who passed away since the last annual meeting of this Association, has left as a record of his labors and a constant reminder of himself, "The Fruits of Ontario," published by the Ontario Department of Agriculture, and the "Apple Growers' Guide," a private undertaking. It is also desired that Mrs. Woolverton should receive a copy of this resolution.

11. **RESOLVED**, that this Association cordially endorses the resolution passed at the Fourth Dominion Fruit Conference in support of Bill 85, introduced into the House of Commons last session by J. E. Armstrong, M.P.

We respectfully urge upon the Government the necessity of placing under the Railway Commission all navigation companies operating on inland waters.

Also the provision of satisfactory legal remedies covering pilfering of, wilful damage and unnecessary delay to fruit in transit.

Also that the Railway Commission have power to adjudicate claims which remain unsettled at the expiration of ninety days.

Also that the Railway Commission be given power to enforce equality of transportation privileges as provided by Bill 85.

12. **WHEREAS**, the work for the betterment of transportation facilities hitherto conducted by the Ontario Fruit Growers' Association generously aided by the Ontario Government has been and is of great value to shippers of all Provinces of the Dominion;

Therefore, this Association in convention assembled, desires to bring to the attention of the Hon. M. Burrill, Minister of Agriculture, and to Mr. D. Johnson, Dominion Fruit Commissioner, the far reaching importance of this work. This Association expresses the hope that the Dominion authorities may see fit to assist in furthering the efforts devoted to this matter.

13. **RESOLVED**, that a message of sympathy be sent to Mr. P. W. Hodgetts, the efficient secretary of this Association, in his illness, with the hope that he will soon be about again. His active form and genial manner are missed amongst us.

14. **RESOLVED**, that as the apple reaches the highest state of perfection in this country; is both beautiful to look upon and very pleasing to the taste; is popular with both rich and poor, and is one of the most healthy and stimulating articles of diet, it is therefore the opinion and wish of this Association that the apple henceforth be regarded as the National Dish of Canada.

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